AN ANALYSIS OF STATE FARM'S AUTOMOBILE INSURANCE EXPERIENCE AND EXPOSURE DISTRIBUTIONS IN THE CHICAGO AREA

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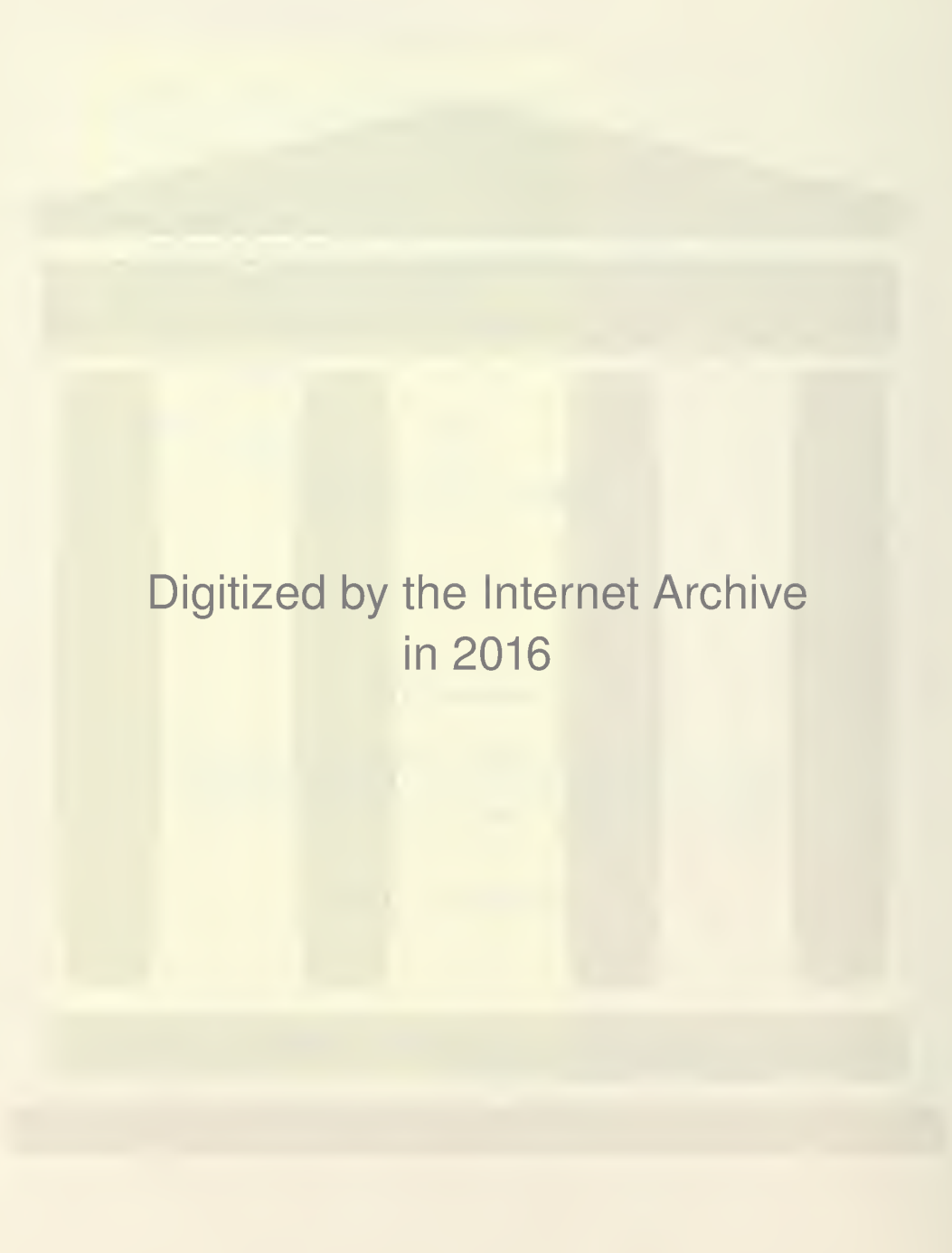AND EXPOSURE DISTRIBUTIONS IN THE CHICAGO AREA

By

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Prepared For

The Illinois Insurance Laws Study Commission,
Representative Bernard E. Epton Chairman
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AND EXPOSURE DISTRIBUTIONS IN THE CHICAGO AREA

SUMMARY

Automobile insurance exposure data by class and territory, which were submitted to the Illinois Insurance Laws Study Commission by the State Farm Mutual Automobile Insurance Company, were analyzed in this report in order to determine whether State Farm's marketing and underwriting patterns in the Chicago area differed substantially from those in the remainder of the state of Illinois. Based on the statistical analysis conducted, it was found that in most cases State Farm's marketing patterns by class and territory in Cook County did not differ significantly from its statewide sales patterns by class for automobile insurance. The few relatively large deviations which were observed may have resulted from random variations or differences in demographic factors among territories in Cook County.

In addition to the class exposure data by territory, State Farm also supplied six years of data for incurred loss ratios, underwriting expense ratios, earned premiums, earned exposures, rate changes, and underwriting profit ratios before and after policyholder dividends in Illinois. These data were used in examining the relationship between the profitability of a rating territory and automobile insurance sales in it. Not surprisingly, it was found that State Farm's sales rate in a territory is influenced by the profitability of the territory. That is, changes in the number of vehicles insured tend to vary directly with changes in territory profitability. However, the change in the sales rate in a territory appears to lag behind changes in profitability and insurance rate changes by about one to two years. Such a lag probably reflects normal response times for marketing and pricing adjustments.

State Farm's policyholder dividend strategy in automobile insurance was also examined. It was found that State Farm's dividend rate during a given year was strongly influenced by underwriting results during the preceding two years. The policyholder dividend rate used by State Farm is applied on a uniform basis across all territories and automobile coverages in the state of Illinois. The rationale for the use of a uniform statewide dividend rate by State Farm is not entirely clear. Although it has some favorable marketing implications, it seems to be somewhat inequitable. In this latter respect, it appears as if policyholders in unprofitable territories are sometimes subsidized by policyholders in the more profitable territories for some automobile coverages during short-run time periods. For example, comprehensive and collision insurance in the territories in Chicago have generally been unprofitable coverages for State Farm. Nevertheless, dividend payments for these coverages were made to policyholders in these territories, even when underwriting losses were incurred. Thus, they appear to have been indirectly subsidized by policyholders in other territories where these coverages generated underwriting profits. However, some of these inequities were probably offset by prospective rate adjustments. In this respect, larger rate increases were instituted in territories where there were underwriting losses and, thus, some of the perceived inequities may have been partially alleviated. However, this approach probably created some new inequities for new and terminating policyholders.

The nature of State Farm's marketing commitment in various territories in Cook County was also examined. Overall, State Farm has increased its sales in most territories, including those in the City of Chicago. However, while the number of sales has been increasing in the territories in Chicago, the relative market importance in Illinois of these territories has been

declining. In general, it appears as if State Farm simply follows a pattern of maximizing its sales in profitable territories and minimizing them in unprofitable ones. This is a non-discriminatory marketing pattern from an economic viewpoint which merely reflects rational marketing behavior by State Farm's management. However, those drivers who have difficulty obtaining automobile insurance coverage may find it difficult to understand or appreciate such rational economic behavior by State Farm or any other insurer. Thus, availability problems can and probably do develop from such a marketing strategy. Some of these problems could probably be alleviated if State Farm adopted a non-uniform dividend policy based on underwriting profits by coverage and territory. Such a policy would tend to promote greater equity among its automobile insurance policyholders in Illinois.

AN OVERVIEW

Automobile insurance exposure data from State Farm Mutual Automobile Insurance Company are analyzed in this report. The purpose of the analysis is to determine whether the distributions of exposures (insured risks) by class in rating territories in the Chicago area differ substantially from exposure distributions by class for the entire state of Illinois, and to explain the possible causes of any significant differences which might be found. In this respect, classification and territorial exposure data which were submitted by State Farm to the Illinois Insurance Laws Study Commission were utilized.

Based on the analysis, it was found that State Farm's marketing patterns by class in the Chicago area did not appear to differ significantly from its statewide sales patterns by class for automobile insurance. The few relatively large deviations by class which were found may be due to statistical variation or differences in demographic and economic factors among territories.

The exposure data for various automobile insurance coverages submitted by State Farm are similar in nature to that submitted by the Insurance Services Office (ISO) which were previously analyzed for the Commission.[1] However, these data bases are not strictly comparable. In the first place, the territorial structures of these two organizations are somewhat different. For example, State Farm uses a method in which territorial boundaries are

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[1] See: Robert C. Witt with Thomas D. Herzfeld, An Analysis of ISO Automobile Insurance Exposure Distributions in the Chicago Area, Report to the Illinois Insruance Laws Study Commission, Sept. 23, 1976.

determined by zip-code boundaries in the Chicago area; whereas the ISO uses a different method.[2] Accordingly, the territories used by State Farm differ somewhat from those used by the ISO in the Chicago area. Moreover, State Farm reported its exposure data for the first 6 months of 1975 to the Commission for 60 classes whereas the ISO submitted data for 25 major classes for accident year 1974. The data, therefore, cannot be readily compared on a strict class-by-class basis in a territory.

Furthermore, class exposure distributions of State Farm cannot be directly compared to those of the ISO because of a pooling problem. Since the class exposure distributions of the ISO reflect the sales of many companies who report to this "bureau," any large variations in insurance writing patterns by class for individual companies would tend to cancel or average out in the aggregate ISO exposure data. Thus, for the ISO exposure data, very sensitive statistical tests would be necessary to detect deviations in class exposure patterns in a territory from the statewide distribution of exposures by class.

For State Farm, any similar deviations from statewide figures would not tend to cancel out because only data for this company alone are analyzed. Thus, the State Farm analysis and results cannot be compared directly to the prior analysis of the ISO exposure data.

State Farm writes about forty per cent of its automobile insurance exposures for the State of Illinois within the Greater Chicago area.[3] As

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[2] See: Robert C. Witt, Automobile Insurance Rating Territories in Illinois: An Assessment, Report to the Illinois Insurance Laws Study Commission, July 20, 1977

[3] It might be noted that Allstate writes about two-thirds of its statewide business in this area.

a consequence, the statewide distribution of exposures by class will be heavily influenced by marketing and underwriting patterns in Cook County. In this respect, comparisons of class patterns by territory to statewide class patterns for State Farm will not tend to yield as much statistical information as they did for the ISO companies, whose business was less concentrated in the Chicago area or distributed somewhat more evenly through- out the State of Illinois. However, while many of the ISO companies are considerably smaller than State Farm, the pooling of their class data tends to wash out any deviations by class in a territory from statewide exposure distributions by class. Exposure data for State Farm are more likely to show some marketing and underwriting patterns which would not be apparent if its data were pooled with other companies. It should also be noted that the ISO companies were diverse enough to cover many different types of underwriting standards and insured risks; whereas State Farm may tend to underwrite less diverse types of risks. Thus, State Farm's marketing patterns might inadvertently suggest some underwriting discrimination if it were in- appropriately compared to the data previously presented in the "ISO Report."

It is obviously possible for a company to practice some underwriting discrimination in a manner which would be difficult to detect statistically. This could be done in a class which comprises a low percentage of the total insured risks in a territory or state. The number of persons suffering from any underwriting or marketing discrimination in such a group of potential risks would probably be relatively small, and would be difficult to detect in statistical studies of insurance sales patterns.

There are a couple of reasons which may help to explain why it would be difficult to detect the type of marketing or underwriting discrimination specified above. First, for a small class, any slight random variation for

such a class in a territory would tend to produce a relatively large deviation from the class percentages on a statewide basis. This implies that it would be difficult to determine the reason for such variations from expected patterns in a small group. Second, credibility considerations necessitated the grouping of most of the small classes into larger classes in this study. This consolidation of small classes tends to level out much of the statistical variation. Discriminatory marketing patterns, thus, would not necessarily be apparent for such consolidated classes in an analysis of exposure data by class and territory in Illinois. However, a company which does as much business in the Chicago area as State Farm does would probably find it difficult to practice much unfair underwriting discrimination on any systematic basis. Moreover, it would possibly be hesitant to do so because of concern for its business image and reputation.

By clearly and objectively specifying some of the limitations of statistical analysis above, this should not suggest that this type of analysis is not useful. On the contrary, it can be quite useful in detecting discriminatory marketing or underwriting patterns, but only in the context of the associated constraints. For example, if no discrimination is apparent in the exposure data, but a large number of black or Spanish-speaking males under 25 report having trouble obtaining coverage from one insurer, that insurer could be practicing some underwriting discrimination which would not be discernable in its exposure data. Of course, it would be possible to compare insurance exposure patterns by class in a territory with demographic data for such an area. If the pattern of insurance sales by class differs significantly from the general characteristics of the driving population in the area, then a regulator might be justified in asking some questions. It is also possible to examine an insurer's exposure data by class

to see whether differences exist between classes in different territories. Such an approach could be useful in comparing sales of automobile insurance to males and females under 25 in suburban and urban areas.

In addition to the class percentage data by territory, State Farm also supplied data for the period 1970 through 1975 for incurred loss ratios (including allocated loss adjustment expenses), underwriting expense ratios (including unallocated loss adjustment expenses), earned premiums, earned exposures, and underwriting profit ratios before and after policyholder dividends. These data were used in examining the relationship between the profitability of a rating territory and the number of exposures written in it. Not surprisingly, it was found that State Farm's sales are influenced by the profitability of a territory and that changes in the number of vehicles insured tend to vary directly with changes in territory profitability. However, the change in the number of exposures written appears to lag behind changes in profitability in a territory by about one to two years. Such lags probably reflect normal response times for marketing changes.

State Farm's dividend structure was also analyzed using the underwriting profit data. It appears that changes in State Farm's policyholder dividend payments are somewhat responsive to the current year's profitability, but more strongly influenced by the performance during the preceding two years. The policyholder dividend rate is uniform across all territories and coverages in Cook County and the state of Illinois. The rationale for the use of a uniform statewide dividend rate is not entirely clear because it appears to be a somewhat inequitable arrangement or policy. In essence, it seems to be a competitive device which allows policyholders in unprofitable territories to be subsidized by policyholders in the more profitable ones. For example, comprehensive and collision insurance in the center city terri-

tories have generally been unprofitable coverages for State Farm. Nevertheless, dividend payments were made to policyholders in these territories for these coverages. Thus, they appear to have been indirectly subsidized by policyholders in other territories where these coverages generated underwriting profits.

The nature of State Farm's marketing commitment in various territories was also examined. In general, State Farm has increased its sales in many territories, including those in the center city area of Chicago. However, while the number of exposures may be increasing in a territory, it is possible that the relative importance of the territory may be declining. This appeared to be the case for some of the center city territories in Chicago. Nevertheless, without additional demographic data, it is not possible to ascertain definitely whether State Farm simply follows a pattern of maximizing its sales in profitable territories and cutting back or minimizing sales in unprofitable territories. This is a nondiscriminatory pattern from an economic viewpoint which merely reflects rational economic behavior by State Farm's management. Among those who have difficulty obtaining automobile insurance coverage, however, such rational economic behavior may be somewhat difficult to understand or appreciate. Thus, availability problems can create some political pressures and problems for insurers and regulators in a state.

In summary, this report attempts to analyze automobile insurance sales patterns of State Farm by territory and classification in the Chicago area of Illinois. For credibility reasons, the exposure data have been grouped into fewer and larger classes than were originally reported by State Farm. The relationship between underwriting profitability and the number of cars insured in a territory for State Farm was also examined.

Nature of the Data Analyzed

The exposure data analyzed in this study were supplied to the Illinois Insurance Laws Study Commission by State Farm. They show the percentage distribution of exposures for private-passenger automobile insurance among 60 classes in each of 12 territories in and around Chicago, as well as the statewide percentage distribution of exposures by class for the first six months of 1975. As is typical for most classification plans, the classes reflect age, sex and marital status of the principal vehicle operator, as well as the intended primary use of the vehicle. The sum of the exposure percentages by class in each territory yields 100 per cent.

Data were submitted by State Farm for four types of automobile insurance coverage: bodily injury and property damage liability insurance, medical payments, comprehensive, and collision insurance. By examining the exposure distributions for these coverages, it was found that sales patterns for all four types of coverages were very similar. For this reason, the distribution patterns for automobile bodily injury and property damage liability insurance are primarily discussed in this report. The results for the other coverages are also presented in the following tables, but are not discussed at great length. The interested reader can easily interpret the results for these other coverages and gain additional information by merely examining the tables related to them.

Nature of the Analysis

In order to compare exposure distributions by class in each territory in a statistically meaningful way, the original data were consolidated for credibility reasons into broader classes, as shown in Table 1. The Adult and Senior Citizen classes were consolidated by intended use of the vehicle, while classes for young adult and youthful drivers were grouped by age,

TABLE 1

CONSOLIDATION OF CLASSES REPORTED BY STATE FARM

Classes Reported by State Farm*	Consolidated Class
	Adult
1A and 1B	Pleasure use
1C and 1D	Drive short mileage to work
1E and 1F	Drive Long mileage to work
1G and 1H and 1L	Business Use
1J and 1K and 1M	Farm Use
	Senior Citizen
2A and 2B	Pleasure Use
2C and 2D	Drive Short Mileage to Work
2E and 2F	Drive Long Mileage to Work
2G and 2H	Business Use
2J and 2K	Farm Use
	Single Females
4B, 4D, 4K, 5B, 5D, 5K	Under Age 21
4A, 4C, 4J, 5A, 5C, 5J	Ages 21-24
	Males
7B, 7D, 7K, 8B, 8D, 8K, 9B, 9D, 9K	Under 21
7E, 7G, 7R, 7F, 7H, 7X	Married 21-24
8A, 8C, 8J, 9A, 9C, 9J, 8L, 8M	Single 21-24
3A, 3C, 3J	Single 25-29

*Detailed definitions of these classes are not given because they are not utilized in this report. The consolidated class definitions on the right hand side of this table are the only ones used.

since the use classifications contained a relatively small proportion of territorial exposures. The combination was achieved by simply summing the individual class percentages to determine the consolidated class percentage.

The original data are presented in Tables 2 through 5 for automobile bodily injury and property damage liability insurance, medical payments, comprehensive, and collision insurance, respectively. In Tables 6 through 9, the original data after consolidation are reported for the respective coverages. For example, the consolidated "Adult Pleasure Use" class in Northwest Chicago shown in Table 6 was formed by adding the percentage values for the two basic sub-classes 1A and 1B presented in Table 2, that is 33.40 + 12.32 = 45.72, which is the percentage value shown in Table 6 for this consolidated class.

As previously indicated, these classes were consolidated for credibility reasons and for convenience of exposition. It is virtually impossible to discern different sales patterns among classes from territory to territory when some of the classes are too small to be statistically credible or reliable. It is basically meaningless to analyze changes in a class which makes up 0.01 per cent of the exposures written in a territory. The exposure data for larger classes, which are more credible, tend to fluctuate less and yield more meaningful statistical results.

The percentage point differences presented in Tables 10 through 13 were computed by subtracting the statewide percentage for each class from the corresponding value for each class in each territory shown in Tables 6 through 9. For example, for automobile bodily injury, in Table 10, the percentage point difference for the "Adult Pleasure Use" class in Northwest Chicago is -3.10 percentage points (45.72 - 48.82). This means that relatively fewer exposures were written in this class in the Northwest Chicago

territory as compared to the statewide percentage. The percentage point differences for medical payments, comprehensive, and collision are shown in Tables 11 through 13, and were obtained in the same manner from Tables 7, 8 and 9.

The relative percentage differences for the four basic automobile insurance coverages in Tables 14 through 17 were obtained by dividing the percentage point difference for each consolidated class in a territory (shown in Tables 10 through 13) by its corresponding statewide percentage value reported in Tables 6 through 9. To complete the example used above, the relative percentage difference in Table 14 for the "Adult Pleasure Use" class in Northwest Chicago was obtained as follows: $100(-3.10 \div 48.82) = -6.35$ per cent which was rounded to minus 6.0 per cent. This relative value demonstrates that even though percentage point differences between the territory and statewide distributions by class in Tables 10 through 13 may be only a few percentage points on an absolute basis, the relative differences may be much larger and significant.

Throughout the paper, the percentage point deviations of territorial from statewide class percentages will be referred to as deviations, deviations from statewide values, or percentage point deviations. The corresponding relative deviations in Tables 14 through 17 are simply referred to as such and no other terminology will be utilized. In both cases, it should be emphasized that the deviations under consideration refer to the deviation of the percentage value for a class in a territory from the statewide per-centage value for the corresponding class.

TABLE 2

CLASS DISTRIBUTIONS OF STATE FARM BY TERRITORY IN COOK COUNTY FOR AUTOMOBILE B.I. AND P.D. LIABILITY INS.

CLASS DISTRIBUTIONS OF STATE FARM BY TERRITORY IN COOK COUNTY FOR AUTOMOBILE MEDICAL PAYMENTS INSURANCE

TABLE 3

CLASS DISTRIBUTIONS OF STATE FARM BY TERRITORY IN COOK COUNTY FOR AUTOMOBILE COMPREHENSIVE INSURANCE

TABLE 4

CLASS	51	52	53	54	61	62	63	64	65	66	67	68	STATE

CLASS DISTRIBUTIONS OF STATE FARM BY TERRITORY IN COOK COUNTY FOR AUTOMOBILE COLLISION INSURANCE

TABLE 5

CLASS	51	52	53	54	61	62	63	64	65	66	67	6H	STATE

TABLE 6

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
ORIGINAL DATA
GROUPED

BODILY INJURY AND PROPERTY DAMAGE

CLASSIFICATION	NORTH-WEST CHICAGO	NORTH-EAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTH-WEST COOK CO.	BERWYN CICERO	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN	STATE-WIDE
ADULT													
PLEASURE	45.72	52.04	51.59	45.85	49.78	49.36	47.74	45.93	48.69	46.62	47.39	45.94	48.82
WORK-SHORT MILE	23.24	21.85	24.16	22.64	15.16	15.54	15.34	17.15	19.12	18.92	17.51	18.29	14.42
WORK-LONG MILE	2.65	3.65	5.45	5.62	4.24	5.25	9.47	12.30	3.51	5.18	7.85	6.69	6.52
BUSINESS USE	1.57	1.69	1.33	1.18	3.21	3.23	2.48	2.36	1.64	2.07	3.01	1.79	1.99
FARM USE	0	.01	0	0	0	.01	.01	0	0	0	.01	0	1.61
SENIOR CITIZEN													
PLEASURE	7.77	5.97	4.02	6.09	4.82	4.35	3.42	1.86	7.74	5.33	2.45	5.32	6.35
WORK-SHORT MILE	.86	.70	.49	.55	.57	.44	.27	.18	.57	.45	.21	.45	.37
WORK-LONG MILE	.07	.09	.07	.11	.12	.15	.10	.11	.08	.12	.06	.10	.11
BUSINESS USE	.11	.11	.06	.05	.15	.12	.05	.05	.07	.05	.04	.05	.06
FARM USE	0	0	0	0	0	0	.02	.04	0	0	.01	0	.38
SINGLE FEMALES													
UNDER AGE 21	3.93	2.02	1.78	4.42	5.66	5.80	6.24	5.41	4.61	5.67	5.38	6.31	5.11
AGES 21-24	1.79	1.39	1.22	1.82	2.34	2.15	1.63	1.39	1.81	2.00	1.89	1.74	1.58
MALES													
UNDER 21	6.27	3.74	3.58	6.33	7.48	7.61	7.95	7.52	6.09	7.14	7.66	7.76	6.87
MARRIED: 21-24	1.66	2.23	2.76	1.68	1.42	1.53	2.10	2.55	2.17	2.19	2.09	2.23	2.35
SINGLE: 21-24	2.81	1.92	1.49	2.38	3.12	2.80	2.15	1.78	2.19	2.63	2.31	2.17	2.14
SINGLE: 25-29	1.79	2.72	2.09	1.39	1.92	1.66	1.09	1.35	1.70	1.65	1.53	1.21	1.33

TABLE 7

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
ORIGINAL DATA
GROUPED

MEDICAL PAYMENTS

CLASSIFICATION	NORTH WEST CHICAGO	NORTH EAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTH WEST COOK CO.	BERWYN CICERO	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN	STATE WIDE
ADULT													
PLEASURE	45.30	51.63	51.40	45.55	49.35	48.55	46.86	44.77	48.22	45.93	46.56	45.11	47.75
WORK-SHORT MILE	23.27	22.17	24.29	22.74	15.36	15.86	15.64	17.58	19.30	19.19	17.88	18.60	14.75
WORK-LONG MILE	2.69	3.68	5.54	5.66	4.28	5.37	4.69	12.56	3.59	5.25	7.99	6.79	6.66
BUSINESS USE	1.52	1.57	1.31	1.15	3.25	3.28	2.49	2.42	1.65	2.07	3.03	1.77	2.01
FARM USE	0	.01	0	0	0	.01	.01	0	0	0	.01	0	1.66
SENIOR CITIZEN													
PLEASURE	7.84	6.04	4.07	6.13	4.87	4.46	3.50	1.94	7.83	5.41	2.48	5.42	6.51
WORK-SHORT MILE	.87	.71	.48	.56	.59	.46	.28	.19	.57	.46	.21	.46	.39
WORK-LONG MILE	.07	.09	.07	.11	.11	.15	.18	.11	.08	.11	.06	.11	.11
BUSINESS USE	.11	.11	.06	.05	.16	.13	.05	.05	.07	.05	.05	.05	.06
FARM USE	0	0	0	0	0	0	.02	.04	0	0	.01	0	.34
SINGLE FEMALES													
UNDER AGE 21	3.97	2.05	1.80	4.49	5.75	5.93	6.33	5.52	4.68	5.77	6.12	6.43	5.24
AGES 21-24	1.81	1.41	1.23	1.83	2.37	2.20	1.65	1.42	1.83	2.05	1.93	1.78	1.61
MALES													
UNDER 21	6.31	3.71	3.49	6.34	7.54	7.67	8.02	7.67	6.13	7.21	7.74	7.83	6.99
MARRIED: 21-24	1.66	2.24	2.76	1.62	1.43	1.51	2.15	2.68	2.18	2.20	2.13	2.27	2.39
SINGLE: 21-24	2.78	1.94	1.47	2.39	3.11	2.80	2.13	1.79	2.16	2.64	2.28	2.16	2.15
SINGLE: 25-29	1.84	2.69	2.06	1.40	1.90	1.65	1.10	1.36	1.71	1.66	1.52	1.22	1.35

TABLE 8

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
ORIGINAL DATA
GROUPED

COMPREHENSIVE

CLASSIFICATION	NORTH-WEST CHICAGO	NORTH-EAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTH-WEST COOK CO.	BERWYN CICERO	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN	STATE-WIDE
ADULT													
PLEASURE	45.94	52.29	52.60	46.35	49.83	49.69	48.57	46.46	48.87	46.86	47.72	46.71	49.21
WORK-SHORT MILE	23.18	22.04	24.45	22.62	15.38	15.61	15.04	17.34	19.27	16.95	17.57	18.19	14.49
WORK-LONG MILE	2.74	3.58	5.20	5.53	4.26	5.27	9.34	12.42	3.55	5.22	7.89	6.61	6.52
BUSINESS USE	1.58	1.64	1.25	1.22	3.32	3.33	2.62	2.47	1.58	2.14	3.11	1.63	2.08
FARM USE	0	.01	0	0	0	.01	0	0	0	0	.01	0	1.58
SENIOR CITIZEN													
PLEASURE	8.04	6.31	4.20	6.34	4.91	4.49	3.59	1.93	8.10	5.57	2.51	5.72	6.58
WORK-SHORT MILE	.94	.71	.50	.58	.58	.45	.28	.19	.59	.47	.21	.47	.39
WORK-LONG MILE	.07	.49	.06	.12	.11	.15	.10	.11	.08	.12	.07	.11	.11
BUSINESS USE	.11	.12	.07	.07	.16	.13	.04	.05	.07	.05	.05	.05	.06
FARM USE	0	0	0	0	0	0	.02	.03	0	0	.01	0	.38
SINGLE FEMALES													
UNDER AGE 21	3.86	1.98	1.73	4.37	5.61	5.79	6.17	5.34	4.56	5.59	5.92	6.14	5.49
AGES 21-24	1.81	1.39	1.22	1.85	2.37	2.16	1.65	1.43	1.83	2.07	1.89	1.79	1.61
MALES													
UNDER 21	5.66	3.38	3.02	5.65	7.13	7.14	7.24	6.98	5.52	6.51	7.23	6.79	6.31
MARRIED: 21-24	1.63	2.21	2.70	1.62	1.47	1.50	2.08	2.56	2.17	2.19	2.08	2.26	2.37
SINGLE: 21-24	2.71	1.81	1.41	2.24	3.40	2.67	2.09	1.68	2.12	2.55	2.18	2.08	2.07
SINGLE: 25-29	1.77	2.61	1.98	1.44	1.86	1.63	1.13	1.41	1.69	1.67	1.53	1.23	1.34

TABLE 9

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
ORIGINAL DATA
GROUPED

COLLISION

CLASSIFICATION	NORTH-WEST CHICAGO	NORTH-EAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTH-WEST COOK CO.	BERWYN CICERO	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN	STATE-WIDE
ADULT													
PLEASURE	46.22	52.59	52.58	46.61	50.10	50.14	48.84	46.46	49.14	47.34	48.22	47.23	49.36
WORK-SHORT MILE	23.59	22.58	24.47	22.96	15.68	15.89	15.07	17.39	19.75	19.01	17.65	18.15	14.67
WORK-LONG MILE	2.84	3.65	5.36	5.76	4.37	5.39	9.39	12.48	3.70	5.26	7.96	6.74	6.63
BUSINESS USE	1.58	1.63	1.23	1.24	3.49	3.54	2.76	2.64	1.63	2.23	3.26	1.93	2.18
FARM USE	0	.01	0	0	0	0	0	0	0	0	.01	0	1.57
SENIOR CITIZEN													
PLEASURE	7.66	5.74	3.78	6.07	4.82	4.48	3.58	1.87	7.84	5.44	2.54	5.63	6.44
WORK-SHORT MILE	.93	.78	.50	.59	.57	.48	.29	.19	.57	.47	.24	.47	.48
WORK-LONG MILE	.07	.09	.07	.12	.11	.15	.10	.12	.08	.11	.06	.11	.11
BUSINESS USE	.11	.13	.08	.07	.17	.13	.05	.07	.08	.05	.05	.05	.07
FARM USE	0	0	0	0	0	0	.01	.02	0	0	.01	0	.38
SINGLE FEMALES													
UNDER AGE 21	3.77	1.92	1.72	4.25	5.92	5.61	6.12	5.18	4.38	5.48	5.79	6.08	4.98
AGES 21-24	1.01	1.37	1.24	1.88	2.39	2.17	1.69	1.49	1.82	2.09	1.92	1.82	1.64
MALES													
UNDER 21	5.15	3.07	2.85	5.17	6.69	6.43	6.77	6.39	4.97	5.99	6.55	6.28	5.79
MARRIED: 21-24	1.71	2.28	2.79	1.71	1.53	1.57	2.18	2.71	2.29	2.32	2.12	2.33	2.49
SINGLE: 21-24	2.68	1.71	1.36	2.09	2.80	2.58	2.01	1.68	2.60	2.44	2.07	2.03	1.98
SINGLE: 25-29	1.85	2.59	1.98	1.47	1.84	1.66	1.14	1.45	1.75	1.74	1.63	1.26	1.38

TABLE 10

PERCENTAGE POINT STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
DIFFERENCES BETWEEN TERRITORIAL AND STATEWIDE EXPOSURE DISTRIBUTIONS
GROUPED

BODILY INJURY AND PROPERTY DAMAGE

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHEAST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-3.10	3.24	2.77	-2.97	.96	.54	-1.00	-2.89	-.13	-2.60	-1.43	-2.92
WORK-SHORT MILE	8.58	7.43	9.74	8.18	.74	1.12	.92	2.73	4.78	4.48	3.09	3.67
WORK-LONG MILE	-3.87	-2.87	-1.07	-.90	-2.32	-1.27	2.95	5.78	-3.01	-1.34	1.33	.17
BUSINESS USE	-.42	-.39	-.60	-.01	1.22	1.24	.49	.37	-.35	.08	1.02	-.20
FARM USE	-1.61	-1.60	-1.61	-1.61	-1.61	-1.60	-1.60	-1.61	-1.61	-1.61	-1.60	-1.61
SENIOR CITIZEN												
PLEASURE	1.42	-.38	-2.33	-.20	-1.53	-2.00	-2.93	-4.49	1.39	-1.82	-3.90	-1.63
WORK-SHORT MILE	.49	.33	.12	.18	.20	.27	-.10	-.19	.20	.08	-.16	.08
WORK-LONG MILE	-.04	-.62	-.04	0	.01	.04	-.01	.00	-.03	.01	-.05	-.01
BUSINESS USE	.05	.05	0	-.01	.09	.06	-.01	-.01	.01	-.01	-.02	-.01
FARM USE	-.36	-.36	-.38	-.36	-.38	-.38	-.36	-.34	-.38	-.38	-.37	-.36
SINGLE FEMALES												
UNDER AGE 21	-1.18	-3.09	-3.33	-.69	.55	.69	1.09	.30	-.50	.56	.27	1.20
AGES 21-24	.21	-.19	-.36	.24	.76	.57	.05	-.19	.23	.42	.31	.16
MALES												
UNDER 21	-.60	-3.17	-3.37	-.54	.61	.74	1.08	.05	-.78	.27	.79	.84
MARRIED: 21-24	-.69	-.12	.41	-.75	-.93	-.82	-.25	.20	-.18	-.16	-.26	-.12
SINGLE: 21-24	.67	-.22	-.65	.24	.48	.66	.01	-.30	.05	.49	.17	.03
SINGLE: 25-29	.46	1.39	.76	.00	.59	.53	-.24	.02	.57	.32	.20	-.12

TABLE 11

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY

PERCENTAGE POINT DIFFERENCES BETWEEN TERRITORIAL AND STATEWIDE EXPOSURE DISTRIBUTIONS GROUPED

MEDICAL PAYMENTS

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-2.45	3.84	3.65	-2.20	1.60	.80	-.89	-2.98	.47	-1.82	-1.19	-2.64
NON-SHORT MILE	8.52	7.42	9.54	7.99	.81	1.11	.89	2.83	4.55	4.44	3.13	3.85
NON-LONG MILE	-3.97	-2.98	-1.16	-1.68	-2.38	-1.24	3.05	5.90	-3.07	-1.41	1.33	.13
BUSINESS USE	-.49	-.44	-.18	-.84	1.24	1.27	.40	.41	-.36	.06	1.02	-.24
FARM USE	-1.66	-1.65	-1.66	-1.66	-1.66	-1.65	-1.65	-1.66	-1.66	-1.66	-1.65	-1.66
SENIOR CITIZEN												
PLEASURE	1.33	-.47	-2.44	-.40	-1.64	-2.05	-3.01	-4.61	1.32	-1.10	-4.03	-1.09
NON-SHORT MILE	.40	.32	.89	.17	.24	.07	-.11	-.20	.18	.07	-.18	.07
NON-LONG MILE	-.04	-.02	-.04	0	0	.04	-.01	-.60	-.03	-.00	-.05	0
BUSINESS USE	.05	.05	0	-.01	.10	.07	-.01	-.01	.01	-.01	-.01	-.01
FARM USE	-.39	-.39	-.39	-.39	-.39	-.39	-.37	-.35	-.39	-.39	-.36	-.39
SINGLE FEMALES												
UNDER AGE 21	-1.27	-3.19	-3.44	-.75	.51	.64	1.09	.28	-.56	.53	.88	1.19
AGES 21-24	.20	-.26	-.38	.22	.76	.59	.04	-.19	.22	.44	.32	.17
MALES												
UNDER 21	-.63	-3.28	-3.50	-.65	.51	.68	1.03	.68	-.86	.22	.75	.84
MARRIED: 21-24	-.73	-.15	.37	-.77	-.96	-.88	-.24	.21	-.21	-.19	-.26	-.12
SINGLE: 21-24	.63	-.25	-.68	.24	.96	.65	-.02	-.36	-.01	.49	.13	.01
SINGLE: 25-29	.45	1.34	.71	.65	.55	.30	-.25	.01	.36	.31	.17	-.13

TABLE 12

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
PERCENTAGE POINT DIFFERENCES BETWEEN TERRITORIAL AND STATEWIDE EXPOSURE DISTRIBUTIONS
GROUPED

CONFIDENTIAL

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-3.07	3.28	3.59	-2.66	.82	.60	-.44	-2.95	-.14	-2.15	-1.29	-2.30
WORK-SHORT MILE	8.69	7.55	9.56	8.13	.69	1.12	.55	2.65	4.78	4.46	3.08	3.78
WORK-LONG MILE	-3.78	-2.94	-1.32	-.99	-2.26	-1.25	2.82	5.96	-2.97	-1.30	1.37	.94
BUSINESS USE	-.50	-.48	-.63	-.86	1.24	1.25	.54	.39	-.56	.06	1.03	-.25
FARM USE	-1.58	-1.57	-1.58	-1.58	-1.58	-1.57	-1.58	-1.58	-1.58	-1.58	-1.57	-1.58
SENIOR CITIZEN												
PLEASURE	1.46	-.27	-2.38	-.24	-1.67	-2.09	-2.94	-4.05	1.52	-1.81	-4.07	-.86
WORK-SHORT MILE	.51	.32	.11	.19	.19	.06	-.11	-.20	.26	.08	-.18	.60
WORK-LONG MILE	-.04	-.02	-.05	.01	0	.04	-.01	-.02	-.03	.01	-.04	0
BUSINESS USE	.05	.06	.01	.01	.12	.07	-.02	-.01	.01	-.01	-.01	-.01
FARM USE	-.38	-.38	-.38	-.38	-.38	-.38	-.36	-.35	-.38	-.38	-.37	-.38
SINGLE FEMALES												
UNDER AGE 21	-1.23	-3.11	-3.36	-.72	.52	.70	1.08	.25	-.53	.56	.85	1.05
AGES 21-24	.20	-.22	-.39	.24	.76	.55	.04	-.18	.22	.46	.28	.18
MALES												
UNDER 21	-.65	-3.01	-3.29	-.66	.82	.79	.93	.67	-.79	.20	.92	.48
MARRIED: 21-24	-.74	-.16	.33	-.75	-.90	-.87	-.24	.19	-.20	-.16	-.29	-.11
SINGLE: 21-24	.64	-.26	-.66	.17	.93	.60	.02	.39	.05	.48	.11	.01
SINGLE: 25-29	.43	1.27	.64	.10	.52	.29	-.21	.07	.35	.33	.19	-.11

TABLE 13

State Farm Classification Distribution by Territory

Percentage Point Differentials Between Territorial and Statewide Exposure Distributions

(Adults)

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	GENEVA ELGIN TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-3.14	3.23	3.22	-2.75	.74	.74	-.52	-2.90	-.22	-2.02	-1.14	-2.13
WORK-SHORT MILE	9.72	7.91	9.05	9.09	1.01	1.22	.43	2.72	5.04	4.34	2.98	5.40
WORK-LONG MILE	-3.19	-2.98	-1.27	-.07	-2.22	-1.24	2.76	5.05	-2.93	-1.37	1.33	.07
BUSINESS USE	-.03	-.55	-.95	-.44	1.31	1.56	.58	.40	-.55	.03	1.08	-.25
FARM USE	-1.57	-1.56	-1.57	-1.57	-1.57	-1.57	-1.57	-1.57	-1.57	-1.57	-1.56	-1.57
SENIOR CITIZEN												
PLEASURE	1.22	-.78	-2.60	-.57	-1.02	-2.04	-2.80	-4.57	1.40	-1.60	-3.94	-.81
WORK-SHORT MILE	.53	.33	.18	.19	.17	.08	-.11	-.21	.17	.07	-.24	.07
WORK-LONG MILE	-.04	-.02	-.04	.01	-.01	.19	-.01	.01	-.03	-.04	-.05	0
BUSINESS USE	.04	.06	.01	0	.14	.06	-.02	0	.01	-.02	-.02	-.02
FARM USE	-.38	-.38	-.38	-.38	-.36	-.38	-.37	-.36	-.38	-.38	-.37	-.38
YOUTHFUL FEMALES												
UNDER AGE 21	-1.21	-3.06	-3.26	-.73	.44	.03	1.14	.24	-.66	.50	.01	1.02
AGE 21-24	.17	-.27	-.44	.24	.75	.53	.05	-.24	.18	.45	.28	.18
MALES												
UNDER 21	-.64	-2.72	-2.44	-.62	.42	.04	.98	.65	-.82	.28	.76	.49
MARRIED 21-24	-.78	-.24	.30	-.78	-.96	-.72	-.31	.22	-.20	-.17	-.37	-.16
SINGLE 21-24	.70	-.27	-.62	.11	.02	.52	.03	-.38	.02	.46	.09	.05
SINGLE 25-29	.47	1.21	.00	.04	.46	.28	-.24	.67	.57	.36	.25	-.12

TABLE 14

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY

RELATIVE DIFFERENCES BETWEEN TERRITORIAL AND STATEWIDE EXPOSURE DISTRIBUTIONS
ROUNDED TO NEAREST PERCENT
GROUPED

BODILY INJURY AND PROPERTY DAMAGE

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	DEKALB CHICAGO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-6	7	6	-6	2	1	-2	-6	-9	-5	-3	-6
WORK-SHORT MILE	60	52	60	57	5	8	6	19	53	31	21	27
WORK-LONG MILE	-59	-44	-16	-14	-36	-19	45	89	-46	-21	20	3
BUSINESS USE	-21	-20	-33	-41	61	62	25	19	-18	4	51	-18
FARM USE	-100	-99	-100	-100	-100	-99	-99	-100	-100	-100	-99	-100
SENIOR CITIZEN												
PLEASURE	22	-6	-37	-4	-24	-31	-40	-71	22	-16	-61	-16
WORK-SHORT MILE	132	89	32	45	54	19	-27	-51	54	22	-43	22
WORK-LONG MILE	-36	-18	-36	0	9	36	-9	-6	-27	9	-45	-9
BUSINESS USE	83	83	0	-17	150	100	-17	-17	17	-17	-33	-17
FARM USE	-100	-100	-100	-100	-100	-100	-95	-89	-100	-100	-97	-100
SINGLE FEMALES												
UNDER AGE 21	-23	-60	-65	-14	11	14	21	6	-10	11	5	23
AGES 21-24	13	-12	-23	15	48	36	3	-12	15	27	26	10
MALES												
UNDER 21	-9	-46	-49	-8	9	11	16	9	-11	4	11	13
MARRIED: 21-24	-24	-5	17	-32	-40	-35	-11	9	-8	-7	-11	-5
SINGLE: 21-24	31	-16	-36	11	40	31	0	-17	2	23	8	1
SINGLE: 25-29	35	105	57	5	44	25	-18	2	28	24	15	-9

TABLE 15

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
RELATIVE DIFFERENCES BETWEEN TERRITORIAL AND STATEWIDE EXPOSURE DISTRIBUTIONS
ROUNDED TO NEAREST PERCENT
GROUPED

MEDICAL PAYMENTS

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-5	0	4	-5	3	2	-2	-6	1	-4	-2	-6
WORK-SHORT MILL	54	58	65	54	7	8	6	19	31	50	21	26
WORK-LONG MILE	-60	-45	-17	-15	-36	-19	45	84	-46	-21	20	2
BUSINESS USE	-24	-22	-35	-43	62	63	24	20	-18	3	51	-12
FARM USE	-100	-99	-100	-100	-100	-99	-99	-100	-100	-100	-99	-100
SENIOR CITIZEN												
PLEASURE	20	-7	-37	-6	-25	-31	-46	-71	20	-17	-62	-17
WORK-SHORT MILL	173	82	23	44	51	18	-28	-51	46	18	-46	18
WORK-LONG MILE	-36	-18	-36	6	0	36	-9	-0	-27	-0	-45	0
BUSINESS USE	83	83	0	-17	167	117	-17	-17	17	-17	-17	-17
FARM USE	-100	-100	-100	-100	-100	-100	-45	-90	-100	-100	-97	-100
SINGLE FEMALES												
UNDER AGE 21	-24	-61	-66	-14	10	13	21	5	-11	12	17	23
AGES 21-24	12	-12	-24	14	47	37	2	-12	14	27	20	11
MALES												
UNDER 21	-10	-47	-50	-9	7	10	15	18	-12	3	11	12
MARRIED: 21-24	-31	-6	15	-32	-40	-37	-10	9	-9	-8	-11	-5
SINGLE: 21-24	24	-12	-32	11	45	30	-1	-17	0	23	6	0
SINGLE: 25-29	33	99	53	4	41	22	-19	1	27	23	13	-10

TABLE 16

State Form Classification Distribution by Territory

Relative Differences Between Territorial and Statewide Exposure Distributions

Rounded to Nearest Percent

Exposures

CLASSIFICATION	NORTHWEST CHICAGO	NORTH CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WELLING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-6	7	7	-5	2	1	-1	-6	-6	-4	-3	-5
NON-SHORT MILE	62	52	66	56	6	9	4	20	33	31	21	26
OPERATION MILE	-50	-45	-24	-15	-35	-19	43	48	-40	-26	21	1
BUSINESS USE	-24	-23	-40	-41	61	60	26	19	-24	3	50	-12
FARM USE	-100	-99	-100	-100	-100	-99	-100	-100	-100	-100	-99	-100
SENIOR CITIZEN												
PLEASURE	27	-4	-30	-4	-25	-32	-45	-71	23	-15	-62	-13
LONG-SHORT MILE	131	82	28	49	47	15	-28	-51	51	21	-46	21
LONG-LONG MILE	-36	-18	-45	9	0	36	-9	-0	-27	9	-36	0
BUSINESS USE	83	100	17	17	167	117	-33	-17	17	-17	-17	-17
FARM USE	-100	-100	-100	-100	-100	-100	-95	-92	-100	-100	-97	-100
SINGLE MEMBERS												
UNDER AGE 21	-24	-61	-66	-14	10	14	21	5	-10	10	16	21
AGES 21-24	12	-14	-24	15	47	34	2	-11	14	24	17	11
MALES												
UNDER 21	-16	-48	-52	-10	13	13	15	11	-13	3	15	8
MARRIED: 21-24	-51	-7	14	-52	-38	-57	-12	8	-8	-8	-12	-5
SINGLE: 21-24	31	-13	-32	8	45	29	1	-19	2	23	5	9
SINGLE: 25-29	32	45	48	7	59	22	-16	5	26	25	14	-8

TABLE 17

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
RELATIVE DIFFERENCES BETWEEN INDIVIDUAL AND STATEWIDE EXPOSURE DISTRIBUTIONS
ROUNDED TO NEAREST PERCENT

COLLISION

CLASSIFICATION	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
ADULT												
PLEASURE	-6	7	7	-6	1	1	-1	-6	-1	-4	-2	-4
AGRA-SHORT MILE	61	54	67	57	7	8	3	19	35	30	24	24
AGRA-LONG MILE	-57	-45	-19	-13	-34	-19	42	88	-44	-21	26	1
BUSINESS USE	-70	-25	-44	-43	68	62	27	21	-25	2	50	-11
FARM USE	-100	-99	-100	-100	-100	-100	-100	-100	-100	-100	-99	-100
SENIOR CITIZEN												
PLEASURE	19	-11	-41	-6	-25	-32	-44	-71	22	-16	-61	-13
AGRA-SHORT MILE	133	75	25	47	42	20	-21	-52	42	10	-50	17
AGRA-LONG MILE	-36	-18	-36	9	-8	36	-9	9	-27	-8	-45	8
BUSINESS USE	57	86	14	0	143	88	-29	0	14	-29	-29	-29
FARM USE	-100	-100	-100	-100	-100	-100	-97	-95	-100	-100	-97	-100
SINGLE FEMALES												
UNDER AGE 21	-24	-61	-65	-15	9	13	23	4	-12	10	16	20
AGES 21-24	10	-16	-24	15	46	32	3	-15	11	27	17	11
MALES												
UNDER 21	-11	-47	-51	-11	16	11	17	18	-14	3	13	8
MARRIED: 21-24	-31	-12	12	-31	-39	-37	-12	9	-8	-7	-15	-6
SINGLE: 21-24	35	-14	-31	6	41	26	2	-19	1	23	5	3
SINGLE: 25-29	34	88	43	7	33	26	-17	5	27	26	18	-9

DEVIATION INDICES

Several indices which measure the total class deviations in a terri-
tory were devised and utilized. These indices are useful because they allow
one to take an overall look at the total class deviations from statewide
values in each territory. Thus, it is easier to determine whether there
are any unusual sales or marketing patterns in the various territories used
by State Farm in Illinois which are examined in this report.

In this study, territorial class deviations from statewide values are
weighted in accordance with the size of the group being considered. For
example, the class for "Single Males Age 21-24" in the Northwest Chicago
Territory cannot be considered as important as the class for "Adult Pleasure
Use" in the same territory, because there are not an equal number of exposures
in each class. As shown in Table 6, the former group comprises 1.79 per
cent of the total exposures written in this territory, whereas the latter
class constitutes 45.72 per cent. On an individual basis, these classes
may all be important when one is considering overall marketing patterns in
a territory. However, the classes representing a larger percentage of the
insurance market should carry more statistical weight than the less important
classes in terms of exposure percentages. Thus, all class deviations were
weighted in accordance with their relative importance in a territory when
various indices were developed.

All the deviation indices in this report were computed by weighting
the deviation for each class in a territory by its original percentage in
the territory. For example, the class deviation variable associated with
a "Single Male Aged 21-24" in the Northwest Chicago territory was multiplied
by .0179 because this class made up 1.79 per cent of the coverage written
in Northwest Chicago, as shown in Table 6. In this respect, each class

contributes to the total deviation for a territory only in proportion to the relative number of exposures it represents in the territory. This method of weighting the class deviations by territory is a simple, but correct, procedure for assigning relative weights to classes without knowing the actual number of exposures written.

Without information about the underlying demographic makeup of the market, the weighted results give the most meaningful picture of underwriting and marketing patterns of State Farm in the Chicago area. Any overall deviations by class are respresented in direct porportion to their relative importance within a territory.

Weighted Sum of Deviations Index (WSDI)

The simplest index to measure the total deviations by class in a territory is the sum of the weighted percentage point deviations of all classes in the territory. This weighted sum of deviations index (WSDI), however, is not very useful sometimes because it will sum to zero if the weighted class deviations are randomly distributed around the statewide class percentages. However, if the sum is materially larger or smaller than zero, it may indicate that the weighted class deviations are nonrandomly distributed. The weighted sum of deviations indices for each type of coverage analyzed are shown in Tables 18 through 21 for each territory. The "column sums" denote the WSDI for each territory. The other figures for each territory (the mean, standard deviation, and coefficient of variation) were calculated for analytic purposes.

Weighted Absolute Deviations Index (WADI)

A slightly more sophisticated approach involves adding the absolute magnitudes of the weighted class deviations in each territory (that is,

summing the class deviations without regard to the sign of the deviations).
This means that all class deviations (positive and negative deviations) are
treated as though they were positive.

The weighted absolute deviations index (WADI) provides a better picture
of the actual amount of variation between territorial and statewide distri-
butions of exposures by class than the WSDI does. The WADI for each terri-
tory will always be equal to or greater than the WSDI, discussed above,
because all the deviations are added, regardless of whether they have posi-
tive or negative values (they are all treated as positive values).

The WADI for each territory (denoted by the term "Column Sums") is
presented in Tables 18 through 21 for automobile bodily injury and property
damage liability insurance, medical payments, comprehensive and collision
respectively.

Weighted Chi-Square Index (WSCI)

The weighted sum of deviations index, WSDI, discussed above has one
major disadvantage as previously indicated. That is, large deviations if
randomly positive or negative, will sum up to zero. Thus, significant devi-
ations by class in each territory will not necessarily be revealed by this
index. Another index which avoids this problem can be computed by squaring
the deviations and dividing by the corresponding statewide value before
weighting and adding the values in a territory. This index, which will be
referred to as weighted chi-square index (WCSI), is useful in that it com-
pares observed territorial values with expected statewide values and weights
the deviations by their relative importance in the territory such that class
deviations for relatively large classes influence the index more than devi-
ations for relatively small ones do in a territory.

If the index for some territory is large, it is reasonable to assume that some of the classification percentages in the territory differ significantly from the statewide values. The weighted chi-square index values for each territory are reported in Table 22 for each of the four basic automobile insurance coverages.

A Technical Note on Indices

It should be noted that these deviation indices were based on the percentage values for consolidated classes in each territory shown in Tables 6 through 9, and that the original class percentages reported in Tables 2 through 5 were not used in deriving these indices. Weighting of class deviations was accomplished by computing the value of the index class by class in a territory. After an individual class deviation in a territory was computed, it was multiplied by the percentage of total exposures it constituted in the territory. For example, in Table 6, the relative contribution made by the class for "Adult Pleasure Use" was 45.72 per cent of the total territorial exposures in Northwest Chicago and 48.82 per cent of the exposures for the statewide distribution of exposures. The percentage point deviation for this class in Northwest Chicago was -3.10, (45.72 - 48.82). Therefore, this class would contribute -1.41, (0.4572 x -3.10), to the WSDI for long mileage exposures in Northwest Chicago; 1.41, (0.4572 x 3.10), to the WADI for these exposures in Northwest Chicago; and 0.0899 (.4572 x $(-3.10)^2$/48.82) to the weighted chi-square index for this territory. Thus, it should be clear that this method of computing the weighted indices recognizes the relative importance of the information available in each case.

TABLE 18

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
COMPUTED FROM GROUPED DATA

BODILY INJURY AND PROPERTY DAMAGE

WEIGHTED SUMMED DEVIATIONS

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	.50	3.03	3.46	.35	.58	.45	-.04	-.16	.77	-.23	-.02	-.54
COLUMN MEANS	.03	.19	.22	.02	.04	.03	-.00	-.01	.05	-.01	-.00	-.03
COLUMN STANDARD DEVIATIONS	.63	.57	.68	.59	.13	.08	.16	.41	.23	.34	.23	.39
COLUMN COEFFICIENT OF VARIATION	24.22	3.03	3.13	27.39	3.48	3.03	-69.23	-40.26	4.80	-24.29	-239.88	-11.69

WEIGHTED ABSOLUTE DEVIATIONS

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	3.74	3.67	4.16	3.37	.95	.78	1.21	2.68	1.27	2.08	1.54	2.27
COLUMN MEANS	.23	.23	.26	.21	.06	.05	.08	.17	.08	.13	.10	.14

TABLE 19

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
COMPUTED FROM GROUPED DATA

MEDICAL PAYMENTS

WEIGHTED SUMMED DEVIATIONS

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	.79	3.34	3.85	.65	.86	.56	.07	-.11	1.02	-.05	.16	-.39
COLUMN MEANS	.05	.21	.24	.04	.05	.04	.06	-.01	.06	-.00	.01	-.02
COLUMN STANDARD DEVIATIONS	.59	.64	.73	.53	.20	.11	.14	.42	.23	.31	.21	.36
COLUMN COEFFICIENT OF VARIATION	11.46	3.09	3.04	13.20	3.77	3.14	34.55	-60.56	3.59	-106.43	20.73	-14.82

WEIGHTED ABSOLUTE DEVIATIONS

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	3.05	4.03	4.59	3.01	1.25	.91	1.13	2.75	1.42	1.94	1.48	2.13
COLUMN MEANS	.22	.25	.29	.19	.08	.06	.07	.17	.09	.12	.09	.13

TABLE 20

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
COMPUTED FROM GROUPED DATA

COMPREHENSIVE

WEIGHTED SUMMED DEVIATIONS

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	.55	3.11	3.86	.46	.54	.51	.17	-.16	.80	-.22	.42	-.35
COLUMN MEANS	.03	.19	.24	.03	.03	.03	.01	-.01	.05	-.01	.01	-.02
COLUMN STANDARD DEVIATIONS	.58	.64	.73	.57	.11	.18	.18	.42	.24	.34	.22	.33
COLUMN COEFFICIENT OF VARIATION	18.68	3.41	3.62	28.06	3.34	3.12	9.37	-43.12	4.72	-24.68	41.61	-14.87

WEIGHTED ABSOLUTE DEVIATIONS

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	3.78	3.72	4.56	3.24	.92	.86	.83	2.76	1.31	2.05	1.53	1.91
COLUMN MEANS	.24	.23	.29	.20	.06	.05	.05	.17	.08	.13	.10	.12

TABLE 21

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY
COMPUTED FROM GROUPED DATA

COLLISION

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	.57	3.24	3.78	.47	.52	.55	.11	-.17	.83	-.19	.12	-.33
COLUMN MEANS	.04	.24	.24	.03	.03	.03	.01	-.01	.05	-.01	.01	-.02
COLUMN STANDARD DEVIATIONS	.66	.64	.72	.59	.11	.11	.18	.41	.26	.33	.20	.31
COLUMN COEFFICIENT OF VARIATION	18.00	3.41	3.04	24.14	3.28	3.15	15.21	-38.62	5.00	-26.96	27.15	-14.93

WEIGHTED SUMMED DEVIATIONS

WEIGHTED ABSOLUTE DEVIATIONS

	NORTHWEST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
COLUMN SUMS	3.89	4.45	3.36	.98	.89	.84	2.71	1.42	1.98	1.43	1.79
COLUMN MEANS	.24	.28	.21	.06	.06	.05	.17	.09	.12	.09	.11

TABLE 22

STATE FARM CLASSIFICATION DISTRIBUTION BY TERRITORY

THE ENTRIES IN EACH COLUMN ARE WEIGHTED CHI-SQUARED VARIABLES HAVING 15 OF
COMPUTED FROM GROUPED DATA

	NORTHWEST CHICAGO	NORTHEAST CHICAGO	CENTRAL CHICAGO	SOUTH CHICAGO	EVANSTON SKOKIE ILLINOIS	NORTH CHICAGO SUBURBAN	SOUTH COOK COUNTY	NORTHWEST COOK COUNTY	BERWYN CICERO TERRITORY	WEST CHICAGO SUBURBAN	ELK GROVE WHEELING	SOUTH CHICAGO SUBURBAN
BODILY INJURY AND PROPERTY DAMAGE	1.38	1.13	1.63	1.16	.15	.11	.23	.87	.38	.34	.24	.31
MEDICAL PAYMENTS	1.32	1.18	1.81	1.06	.15	.12	.25	.91	.36	.32	.25	.29
COMPREHENSIVE	1.42	1.15	1.61	1.13	.14	.11	.20	.92	.39	.34	.25	.25
COLLISION	1.49	1.24	1.86	1.17	.14	.12	.19	.88	.43	.32	.24	.22

Results for Deviation Indices

The Weighted Sum of Deviations Indices (WSDI's), the "Column Sums" in Tables 18 through 21, are quite low for every territory. In fact, the mean class deviation in every territory is so small that it is not statistically different from zero at any reasonable level of significance. That is, none of the territory class averages could be shown to have a sufficiently high probability of being unequal to zero to reject the hypothesis that the class mean was equal to zero. This suggests that there is a random pattern of positive and negative percentage point differences by class in each of the territories and for all of the coverages shown in Tables 10 through 13 after they are weighted by importance in each territory.

The Weighted Absolute Deviation Indices (WADI's), shown in Tables 18 through 21, are also quite low. As previously indicated, the WADI values will be somewhat higher than the corresponding WSDI values since all deviations (positive and negative) are treated as though they were positive in the WADI. A large value for the WADI corresponding to a small WSDI value in a terri- tory indicates that there is a fairly large total deviation which is dis- tributed on a weighted basis evenly about zero. This appears to be the cause for the small WSDI's in two urban territories, Northwest and South Chicago, whose larger WADI's are in line with the other center city territories.

The Weighted Chi-Square Index (WCSI) in Table 22 shows larger values for the center city territories and Northwest Cook County for all of the automobile insurance coverages. The lowest WCSI's are encountered in the Evanston-Skokie and North Suburban Chicago territories. The remaining ter- ritories show intermediate WCSI values. This threefold division in magnitudes of the WSCI's is not evident for the other, less sensitive indices.

There are two major conclusions to draw from the study of the various indices. First, after each class deviation is weighted by its relative importance in a rating territory, the summed deviations are very low in each territory and probably not significantly different from zero in most cases. Thus, each territory differs very little from the state as a whole in terms of marketing patterns by class. Second, even though the deviations are very low in general, the center city territories in Chicago tend to have somewhat larger deviations than the suburban territories. This may indicate that the underwriting or marketing patterns of State Farm in the center city area of Chicago differ somewhat from such patterns in the suburban territories around Chicago. However, this cannot be determined without information about the underlying demographic characteristics of these territories. In fact, this difference in deviations may be due to some differences in driving patterns between these two major types of territories, as is suggested shortly.

The fact that the weighted deviation indices in Tables 18 through 22 are all very low implies that there is very little variation in the terri- torial values from the state as a whole. Looking back at the consolidated exposure data in Table 6 for bodily injury and property damage liability, it can be seen that the "Adult Pleasure Use" category varies relatively little among territories. The range of values is from a low of 45.72% of exposures written in Northwest Chicago to a high of 52.06% in Northeast Chicago. The geographic proximity of the territories with the highest and lowest percentages may be due to slightly different marketing patterns or differences in demographic factors between these two territories. The statewide percentage figure for this class is 48.82% and it can be seen that the variance of the class deviations around the statewide value is also quite low.

Similar results for this class can be observed in Tables 7 through 9 for the other types of coverage: medical payments, comprehensive, and collision. However, the variation in percentages among the territories for the adult pleasure use class are somewhat larger in magnitude and proportion than for liability insurance. The fact that the "Adult Pleasure Use" class shows less variation than many of the other classes for these non-liability coverages may indicate less variation in marketing or underwriting standards among territories for this class.

Relative Differences

The relative differences between territorial and statewide distributions of exposures by class are presented in Tables 14 through 17. These figures enable one to compare the proportion of exposures that a class comprises in a territory with the proportion of exposures it constitutes for the entire state. A positive value indicates that the territorial percentage for a class is greater than its proportion for the state as a whole. Similarly a value less than zero indicates that the percentage for a class is smaller in a territory than it is statewide. A value of minus 100 per cent means that no coverage was written in a class in a territory. This occurred for the "Farm Use" class in most urban territories, which would be expected.

The relative differences may also indicate when exposure data in some class is only marginally credible. In Table 14, for example, the "Farm Use" class in each territory was minus 100 per cent, meaning no coverage was written in this class, or it had a value of less than minus 90 per cent which indicates few exposures in the class. In general, these large negative figures indicate that so little coverage was written in the territory under consideration that it is highly unlikely that the data has much credibility

or economic meaning. Large fluctuations in relative class differences among territories may indicate in some instances that few exposures are written in a class statewide. In such a case, the very small amounts of coverage written in such a class among the territories would tend to make the relative differences very large. Such large fluctuations are possibly an indication that relatively few exposures are written in the class, and hence the results may not be very credible or meaningful.

Patterns in the relative percentage differences help to explain the relatively large index values for class deviations by territory which were observed earlier for the four territories in the city of Chicago. For example, large relative deviations are evident in the Adult "Drive Short Mileage to Work" class in the four center city territories; whereas, the deviations in suburban territories are somewhat lower, as can be observed in Tables 14 through 17. The consolidated class data in Tables 6 through 9 show that this "Short Mileage" class is only second in importance to the "Adult Pleasure Use" class in terms of coverage written in these territories. Moreover, the proportion of short mileage coverage written in the center city territories is generally higher than in the suburbs. Since the deviation indices previously analyzed are based upon the proportion that each class comprises of the total exposures written in a territory and the deviations are large in these territories, it appears that most of the differences in the deviation indices between the center city and suburban territories are due to the deviations in the "Adult Driving Short Mileage to Work" class.

The pattern of signs for the relative deviations can also be a useful indicator of underwriting or marketing patterns among territories. If there are two categories of exposure data which are likely to be similar under normal circumstances, then actual differences in exposure percentages might

be attributable to discriminatory marketing or underwriting practices if other factors cannot account for the differences.

For example, the relative difference tables (Tables 14 through 17) for both males and females under 21 years of age show positive relative deviations only in suburban territories. The one exception in both cases is the "Berwyn-Cicero" territory. This sign pattern probably reflects the demographic make-up of these territories rather than a specific marketing pattern. More young people with access to cars are likely to be found in the suburbs than the downtown areas when family affluence and other wealth factors are considered.

Furthermore, it is not particularly meaningful to compare the under-lying exposures for these classes because they result from different types of classification criteria. The females in the "under 21" class are all single; whereas the males may be married or single in this age category due to the nature of the classification criteria. Females, regardless of age, are rated as adults when they marry, and since females tend to marry earlier than males, single females under 21 might make up less of the ex-posures in a territory than males under 21. A look at Table 6 confirms this observation that females under 21 make up less of the exposures than males under 21 in every territory under consideration, as well as for the state, even though there is no reason to expect territories to have a large imbal-ance between young male and female drivers. Moreover, young females have generally been regarded by insurers as better automobile insurance risks than males. So one would not expect State Farm to avoid underwriting young females. Thus, the nature of State Farm's classification plan, rather than its underwriting standards, probably explains the observed differences here.

As will be further explained in the next section, there are few classes where all the underlying factors can be assumed to be constant. Thus, in most cases, relative deviations from statewide averages will not necessarily indicate discriminatory underwriting or marketing practices. They may merely reflect underlying demographic differences.

Limitations of the Analysis

Much of this study deals with comparisons of territorial exposure percentages by class with corresponding statewide percentages. The extent to which the territorial values by class differ from the statewide values was analyzed, and possible explanations for the differences encountered were suggested. These comparisons of territorial and statewide values by class were designed to discover any major differences in underwriting or marketing patterns among the various territories used by State Farm in the Chicago area of Illinois. However, as previously indicated, any inference that large differences between territorial and statewide exposure percentages by class is due to unfair underwriting discrimination would not necessarily be valid.

Such an inference might not be valid because it would have to be based upon the assumption that the demographic make-up of a given territory does not differ significantly from that of the state as a whole. Such an assumption would obviously be difficult to justify because the City of Chicago tends to have different demographic and socio-economic characteristics than rural Illinois. Accordingly, it might be reasonable to expect some differences in distributions of automobile insurance exposures by class in different territories, depending on the demographic and economic characterisitcs of the area under consideration.

In this respect, the territorial deviations by class from statewide values could be relatively large for some classes and small for others depending on the territory. Since these variations would tend to be influenced by economic and demographic patterns, they might not appear to be reasonable based on an analysis of percentage distribution patterns alone. Thus, they must be carefully interpreted in the light of the demographic and economic data for the territory which is not readily available.

Underwriting Considerations

Since some variation from statewide values is to be expected for each territory, the question arises as to why the summed deviation indices previously examined were low in some territories and relatively high in others. The answer seems to involve several aspects. In the first place, the deviations in urban territories are generally larger than the deviations in suburban territories. This seems to confirm that some differences among urban and suburban territories do exist. The size of these differences depends in part upon demographic factors, competitive conditions, and the effectiveness of agents within a territory, among other influences.

Underwriting standards and the selection of insured risks by agents and underwriters of an insurer also influence these differences among territories. Underwriting standards may be designed not only to screen out substandard drivers, but also to select only those risks which meet certain other criteria, such as a good credit rating, good morals, or other subjective factors. Similarly, companies may make agents defacto underwriters by following a policy of cancelling agency contracts where the agency has a higher than average loss ratio for its portfolio of business (despite the fact that the insurer specified the classification system and set the rates for each class).

The characteristics of an "insurable risk" may also vary somewhat from territory to territory because of environmental factors. For example, insurers might be hesitant to underwrite comprehensive insurance on new cars in areas with high theft rates.

Due to this possible variation in underwriting standards and other factors, the potential "insurance population" probably varies somewhat among territories. As a result, similar applicants may encounter varying difficulty in obtaining insurance from a given company depending on the territory in which they live.

Underwriting standards not only screen out undesirable risks from an insurer's viewpoint, but also are intended to develop a relatively homogeneous set of insured risks from the potential "insurable population". There is a strong incentive for insurers to develop and maintain a portfolio of homogeneous risks since the loss experience of such a population can be statistically assessed more reliably than that for a heterogeneous set of risks. The loss experience of a homogeneous set of risks allows more accurate estimates of future loss experience, and better loss cost predictions tend to result in premiums which more accurately reflect the degree of underwriting risk faced by the insurer. Such a situation is obviously beneficial to the insurer because it tends to reduce some of the uncertainty that it faces. Of course, it is also economically fair to insureds covered by the insurer because similar risks will be paying similar rates for their insurance coverage.

If underwriters are attempting to select a homogeneous set of risks from a potential insurable population, a specific company may be reluctant to sell insurance in some neighborhoods because it perceives a different or undesirable loss exposure there. Even though equivalent insurance may be available in those neighborhoods from other companies with different underwriting

standards, there may be complaints concerning the availability of insurance. These complaints, however, may largely reflect the unwillingness of consumers to shop for automobile insurance.[4]

Of course, when an insurance company claims to be increasing its sales commitment in the center city area of Chicago, it should try to explain the nature of its commitment. Is it making a stronger effort to reach only those potential insureds who meet its specific underwriting standards, or is it relaxing some of its underwriting standards so as to encompass a larger potential insurable population? For an independent observer, it is often difficult to obtain data to answer such questions. Underwriting standards are subjective in nature and tend to be influenced heavily by the judgement of agents and underwriters.

If detailed demographic data were readily available, it might be possible to determine how well a specific insurer was serving a territory in terms of its potential insurable population, as well as how well the territory was being served by all insurers. Such patterns usually can only be observed over time with matching demographic and insurance data which are usually not readily available. Nevertheless, some insurance data from State Farm are analyzed in the next section in order to make a rough assessment of its sales activity in the Chicago area, even though matching demographic data were not readily available.

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[4] See: The Automobile Insurance Consumer: Patterns and Profiles, The Kemper Insurance Companies, 1975, p. 3.

LOSS RATIOS AND MARKETING TRENDS

IN THE CHICAGO AREA

The Economic Environment

Before examining State Farm's marketing program in metropolitan Chicago, the economic environment in which the company operated during the six year period examined, 1970 through 1975, should be considered in order to obtain a broader perspective.[5] Hopefully, this discussion will help to explain some of the marketing trends in the Chicago area which are presented later.

The data analyzed later in this section of the report covers the period 1970 through 1975. These six years, plus the years 1969 and 1976, reflect a complete underwriting cycle for the automobile insurance industry. The cycle began with heavy losses in 1969 which was followed by a recovery period with relatively high profits in 1971 and 1972. However, underwriting profits started to decline in 1973 and this was followed by poor loss experience in 1974 and 1975. Underwriting experience took a nosedive toward the end of 1974 and remained adverse during 1975. Finally, underwriting experience started to recover again in 1976.

In 1969, State Farm incurred a 6.5 per cent underwriting loss after dividends on a countrywide basis which amounted to 91.7 million dollars after dividends. Partly as a result of this adverse underwriting experience, State Farm's premium to surplus ratio rose to almost 4 to 1 which is generally

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[5] Unless otherwise indicated, the information in this section was obtained from various issues of Best's Review (Property-Casualty Ed) and from a memorandum enclosed with a letter from Jean C. Hiestand of State Farm to Roger A. Bixby, dated August 16, 1977. The memorandum was developed by Dale Nelson, an actuary for State Farm, and his staff. It contained various comments on an earlier draft of this Report.

considered to be higher than what regulators and managers usually desire. As a result, the company felt that it had to take certain steps to improve its underwriting experience, and marketing programs were altered to accomplish this objective.

In Illinois during 1969, State Farm's underwriting results were not quite as bad as they were on a countrywide basis. Nevertheless, the company suffered a 1.88 million dollar underwriting loss which was about 1.6 per cent of its automobile insurance premiums after dividends. Due to the adverse results in Illinois and countrywide, State Farm decided to use its marketing program to protect the company's surplus from excess new business. In other words, they tried to cut back or reduce their growth rate in order to improve the quality of the risks they selected and to regain their profitability. As a result of these changes in its marketing program, State Farm was able to obtain an underwriting profit by the end of 1971. The improved underwriting profits were partly due to a slowdown in the economy and the rate of inflation. Due to these favorable developments, State Farm's underwriting profits in automobile insurance rose dramatically through 1973. Moreover its premium to surplus ratio started to decline and the company was able to continue its policy of managed growth in sales, according to State Farm.

State Farm and the automobile insurance industry experienced another very profitable year in 1972. In late 1973, underwriting results started to deteriorate somewhat due to the energy crisis and an increase in the rate of inflation. Investment experience also started to turn sour during the last part of 1973. By 1974, underwriting losses had developed for much of of the automobile insurance industry, even though the 55 mile per hour speed limit had gone into effect and the economy had cooled off. The stock market slump and the deteriorating underwriting results in 1974 caused a

dramatic loss of insurance surplus or capacity. Of course, since State Farm had only an extremely small amount of equity in its investment portfolio, it was not affected very much by the stock market slump. However, its underwriting experience was adverse, and it was subject to some market pressure due to the loss of capacity in much of the remainder of the automobile insurance industry.

In 1975, State Farm incurred an underwriting loss of 90.2 million dollars after dividends on a countrywide basis. Nevertheless, State Farm's premium-to-surplus ratio at this point in time was approximately 2 to 1. According to State Farm, it was able to reduce its premium to surplus ratio from 4 to 1 in 1969 to around 2 to 1 in 1975 through a pattern of controlled growth. In 1976, the underwriting cycle was completed in that State Farm earned a countrywide underwriting profit of 16.5 million dollars and its premium-to-surplus ratio remained close to 2 to 1.

Obviously State Farm's marketing program and underwriting standards were influenced by its underwriting and investment results during the seven year period analyzed above. In general, they attempted to cut back their growth rate and tighten their underwriting standards during adverse years in order to minimize adverse underwriting results and to control the magnitude of the premium-to-surplus ratio. From an economic viewpoint, this appears to be a rational management strategy.

The economic environment described above should provide the necessary perspective for understanding the following analysis of State Farm's marketing program in Chicago during the period 1970 to 1975.

General Marketing Trends in Chicago

As previously indicated, it is difficult to make meaningful analyses of exposures by class within a territory. Aggregate territorial exposure data,

on the other hand, do provide some insights into the marketing practices of an insurance company. For example, in a statement by Jean Heistand on behalf of State Farm before the Illinois Insurance Laws Study Commission on January 18, 1974, an increase of 17.2 per cent in the number of automobile insurance policies written in territory 53 (the "Central Chicago" territory) was reported.[6] However, the types of automobile insurance coverage which showed this increase were not specifically mentioned.

A 17 per cent increase is a very respectable increase in the number of exposures in any territory, but it is necessary to consider it in the context of increases in other territories. For example, if other comparably sized territories show a 30 per cent increase in sales, a 17 per cent increase would not necessarily be very impressive. On the other hand, if there were only a 10 per cent average increase in sales in other comparable territories, a 17 per cent increase would appear to be relatively large. In addition, the reporting procedure itself must be considered before conclusions can be drawn.

In Tables 23 through 26, earned exposures for the basic automobile coverages of State Farm are presented for 1970 through 1975. The exposure data here reflect earned car years rather than the number of policies in force which were used by Heistand in his 1974 presentation to the Commission. Accordingly, the number of earned car years presented here will not be strictly comparable with the data presented by State Farm earlier. However, the basic trends underlying both sets of data are similar, so it is still possible to compare the sales trends reflected by these data bases.

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[6] Hiestand, Jean D., "Statement on Behalf of State Farm Mutual Automobile Insurance Company, State Farm Fire and Casualty Company to the Illinois Insurance Laws Study Commission on January 18, 1974," p. 3.

TABLE 23

EARNED CARS

BODILY INJURY/PROPERTY DAMAGE LIABILITY

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	735,215	735,755	764,557	814,704	873,589	908,605
51	27,270	27,839	28,584	30,504	33,218	34,657
52	32,081	29,354	29,260	32,195	34,967	35,674
53	22,069	20,288	20,174	21,313	23,076	22,721
54	37,232	36,390	36,449	38,394	40,180	40,311
61	18,395	18,826	19,441	21,363	22,869	23,805
62	19,446	20,319	21,485	23,479	25,663	19,679
63	16,362	17,098	18,492	20,532	23,087	24,716
64	16,109	17,580	19,882	22,639	25,384	27,694
65	21,735	22,417	23,174	24,724	26,432	18,978
66	35,717	36,600	37,790	40,499	43,476	52,006
67	16,803	17,705	19,498	22,264	25,129	26,745
68	43,575	43,306	44,576	46,868	49,886	37,941
69						5,614
70						8,447
71						10,729

Source: State Farm Mutual Automobile Insurance Company

TABLE 24

EARNED CARS

MEDICAL PAYMENTS COVERAGE

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	693,959	703,017	373,206	796,341	850,512	882,517
51	25,604	26,422	13,824	30,094	32,689	34,031
52	30,017	27,769	14,368	31,622	34,264	34,869
53	20,931	19,503	9,836	21,015	22,764	22,362
54	35,282	34,837	17,774	38,014	39,744	39,806
61	17,131	17,699	9,446	20,888	22,351	23,255
62	18,008	19,121	10,438	22,941	25,035	19,149
63	15,288	16,162	9,094	20,051	22,465	24,018
64	15,125	16,768	9,842	22,110	24,709	26,909
65	20,584	21,432	11,217	24,301	25,952	18,594
66	33,934	35,200	18,327	39,887	42,735	51,053
67	15,559	16,680	9,603	21,782	24,462	26,032
68	40,767	41,137	21,571	46,051	48,939	37,120
69						5,497
70						8,269
71						10,424

Source: State Farm Mutual Automobile Insurance Company

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TABLE 25

EARNED CARS

COMPREHENSIVE

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	668,591	660,072	681,107	730,562	789,397	825,190
51	25,618	25,819	26,186	27,995	30,676	31,960
52	29,647	26,499	25,967	28,705	31,471	32,131
53	20,090	17,915	17,548	18,547	20,108	19,791
54	34,424	33,186	32,729	34,554	36,223	36,251
61	17,475	17,792	18,187	20,052	21,583	22,528
62	18,445	19,094	20,089	22,021	24,236	18,665
63	14,953	15,432	16,523	18,404	20,845	22,348
64	15,156	16,271	18,265	20,960	23,778	26,054
65	20,413	20,808	21,234	22,691	24,262	17,505
66	33,363	33,673	34,413	36,985	39,867	47,981
67	15,973	16,642	18,182	20,864	23,660	25,412
68	39,425	38,349	39,107	41,280	44,279	33,666
69						5,000
70						7,484
71						10,222

Source: State Farm Mutual Automobile Insurance Company

TABLE 26

EARNED CARS

COLLISION

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	592,800	582,400	603,824	651,676	704,676	732,997
51	22,123	22,418	22,931	24,724	27,198	28,158
52	26,431	23,424	23,216	26,030	28,658	29,093
53	18,209	16,262	16,192	17,298	18,899	18,418
54	30,517	29,467	29,291	31,215	32,824	32,721
61	15,367	15,708	16,172	17,950	19,370	20,156
62	16,198	16,889	17,772	19,612	21,736	16,626
63	13,316	13,740	14,841	16,680	18,893	20,168
64	13,336	14,284	16,179	18,682	21,165	23,024
65	17,703	18,137	18,711	20,122	21,500	15,334
66	29,480	29,859	30,690	33,149	35,805	42,900
67	14,040	14,581	16,091	18,593	21,125	22,570
68	34,794	33,989	35,003	37,251	40,058	30,502
69						4,490
70						6,670
71						9,008

Source: State Farm Mutual Automobile Insurance Company

For this discussion, the exposure data for automobile bodily injury and property damage liability insurance in Table 23 will be considered. A look at the exposure data in Tables 24 through 26 will confirm the similarity of patterns for the other types of coverage. If State Farm had based its report on the increase in earned exposures for the liability coverages between 1971 and 1974 in Central Chicago (territory 53), an increase of 2,788 (23,076 - 20,288 = 2,788) earned exposures would have been reported. This is a 13.7 per cent (2,788/20,288) increase in earned exposures from 1971 to 1974. This value is analogous to the 17.2 per cent increase mentioned by State Farm in its earlier statement to the Commission.[7]

If the number of earned exposures for 1970 is compared with the number of earned exposures for 1974 in the center city territory (Territory 53) in Table 23, the results for this longer time period are less dramatic. An increase of 1,007 earned exposures (23,076 - 22,069 = 1,007), which is equivalent to an increase of 4.6 per cent, would have been found. This is approximately one-third of the 1971-1974 increase. Earned exposures for comprehensive insurance in Territory 53 showed an 11.74 per cent increase between 1971 and 1974, a 0.09 per cent increase between 1970 and 1974, and a decrease of 1.49 per cent between 1970 and 1975 as can be observed in Table 25. Earned exposures for collision in the same territory (see Table 26) increased 16.2 per cent between 1971 and 1974, 3.79 per cent between 1970 and 1974 and 1.15 per cent between 1970 and 1975. Thus, the rate of change in sales appears to be highly influenced by the time period used to compute this rate.

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[7] "Hiestand Statement on Behalf of State Farm," p. 3 and Exhibits A and B.

A closer look at Territory 53 in Table 23 shows a decrease in the number of liability exposures between 1970 and 1971, a further decrease in 1972, increases in 1973 and 1974, and another decrease in 1975. The increase between 1970 and 1975 is 3 per cent. Thus, it would appear that the 17 per cent increase in sales between 1971 and 1974 reported by State Farm to the Commission was the high point in a series of alternating increases and decreases in the number of earned exposures in the Central Chicago Territory. A pattern of increases and decreases is also present in the other center city territories in Chicago (Territories 51, 52, and 54). The remaining suburban territories show a steady increase in the number of earned exposures, except for Territories 62, 65, and 68 in 1975. The exposures in these three territories apparently decreased in 1975 because their boundaries were changed. [8]

Based on some recent information for the number of policies in force for automobile insurance, the four territories in the City of Chicago showed the following percentage increases between 1970 and 1975. [9]

Chicago Territory	Percentage Increase
51-Northwest	27.4%
52-Northeast	10.2
53-Central	4.6
54-South	3.6
Total	11.4

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[8] In 1975, State Farm divided several territories and renumbered them. Territory 71 was separated from Territory 62, and Territories 69 and 70 were carved out of Territory 68. Part of Territory 65 was also shifted to Territory 66. These changes seem to explain why sales decreased in the three territories (Territories 62, 65, and 68).

[9] This information was derived from the memorandum enclosed with the letter to Bixby from Hiestand of State Farm, op. cit.

It can be seen that between 1970 and 1975 the largest increases in policies
in force were in Northwest and Northeast Chicago, and the smallest increases
were in Central and South Chicago. The average increase for the City of
Chicago was 11.4 per cent during this five year period. Thus, it appears
as if State Farm has been slowly increasing its sales in the City of Chicago.
However, the rate of increase varies somewhat from territory to territory in
the city.

It is also interesting to examine the percentage of registered automo-
biles insured by State Farm in the four territories in Chicago. These market
percentages are based on policies in force as a fraction of registered auto-
mobiles and are reported below for 1970 and 1975.[10] As can be seen, State

Territory	Market Percentages		Percentage Point Gain or Loss
	1970	1975	
51-Northwest	20.3%	25.5%	5.2
52-Northeast	15.7	18.8	3.1
53-Central	8.6	9.4	0.8
54-South	16.1	15.5	-0.6
Total	14.5	16.3	1.8

Farm increased its market percentage in three of the four territories in
Chicago between 1970 and 1975. Overall, it increased its market share by
1.8 percentage points in the City during this period.

Loss Ratios and Exposure Trends in Chicago

As previously indicated, five years of data for loss and allocated loss
adjustment expense ratios, underwriting profit ratios, and earned exposures
were submitted by State Farm to the Commission. These data can be used to
analyze relationships between underwriting profits and insurance sales and

[10] Ibid.

to examine changes in sales patterns. Such an analysis can provide some additional information about State Farm's marketing activities in the Chicago area.

In order to assess State Farm's claim of an increased commitment to the center city territories of Chicago, it was also decided to look at the relative distribution of State Farm's exposures in each territory of the Chicago region of Illinois and to examine changes in these market percentages over time. Table 27 shows the percentage of statewide exposures written by State Farm in each territory in Cook County during 1970 and 1975 for automobile bodily injury and property damage liability insurance. These values were obtained from Table 23 by dividing the territorial earned exposures in each territory by the total statewide earned exposures for the year. The rate of change in the territorial percentages between 1970 and 1975 was computed by subtracting the 1970 percentage from the 1975 percentage and dividing this difference by the 1970 percentage. For informational purposes the territories were also ranked by magnitude of their percentages for each year. The territory with the largest percentage was given the rank of 1. Similar results are shown in Tables 28, 29, and 30 for medical payments, comprehensive and collision insurance, respectively. The territories have been grouped into "urban," "near suburban," and "remote suburban" territories in order to reflect their approximate distance from the center city area for each of the coverages shown in Tables 27 through 30.

The total percentage for the Chicago area (Cook County) shows a slight increase in the relative number of exposures between 1970 and 1975 for all coverages. During both 1970 and 1975, the Chicago area territories represented about 52 per cent of the exposures written by State Farm in Illinois. However, the proportion of the exposures in the urban territories within

TABLE 27

EARNED CAR YEARS BY TERRITORY AS A PERCENTAGE OF STATEWIDE VALUES FOR
AUTOMOBILE B.I. AND P.D. LIABILITY INSURANCE DURING 1970 AND 1975

Territory Number	Territory Name	Percentages 1970	1975	Percentage Change	Ranks 1970	1975
	Urban Territories					
51	Northwest Chicago	3.71	3.81	+2.7	5	5
52	Northeast Chicago	4.36	3.93	-9.9	4	4
53	Central Chicago	3.00	2.50	-16.7	6	11
54	South Chicago	5.06	4.44	-12.3	2	3
	Urban Subtotal	16.14	14.68	-9.0	-	-
	Near Suburban Territories					
61	Evanston-Skokie	2.50	2.62	+4.8	9	10
65	Berwyn-Cicero	2.96	2.09	-29.4	7	12
66	West Suburban Chicago	4.86	5.72	+17.7	3	1
68+69+70	South Suburban Chicago	5.93	5.72	-3.5	1	2
	Near Suburban Subtotal	16.25	16.15	-0.6	-	-
	Remote Suburban Territories					
62+71	North Suburban Chicago	2.64	3.35	+26.9	8	6
63	South Cook County	2.23	2.72	+22.0	11	9
64	Northwest Cook County	2.19	3.05	+39.3	12	7
67	Elk Grove-Wheeling	2.29	2.94	+28.4	10	8
	Remote Suburban Subtotal	9.34	12.06	+29.1	-	-
TOTAL		41.30	42.89	+2.8	-	-

Source of underlying data: State Farm Mutual Automobile Insurance Company

TABLE 28

EARNED CAR YEARS BY TERRITORY AS A PERCENTAGE OF STATEWIDE VALUES FOR
AUTOMOBILE MEDICAL PAYMENTS INSURANCE DURING 1970 AND 1975

Territory Number	Territory Name	Percentages 1970	1975	Percentage Change	Ranks 1970	1975
	Urban Territories					
51	Northwest Chicago	3.69	3.86	+5	5	5
52	Northeast Chicago	4.33	3.95	−9	4	4
53	Central Chicago	3.02	2.53	−16	6	11
54	South Chicago	5.08	4.51	−11	2	3
	Urban Subtotal	16.12	14.85	−8	−	−
	Near Suburban Territories					
61	Evanston-Skokie	2.47	2.64	+7	9	10
65	Berwyn-Cicero	2.97	2.11	−29	7	12
66	West Suburban Chicago	4.89	5.78	+18	3	1
68+69+70	South Suburban Chicago	5.87	5.77	−2	1	2
	Near Suburban Subtotal	16.20	16.29	+1	−	−
	Remote Suburban Territories					
62+71	North Suburban Chicago	2.59	3.35	+29	8	6
63	South Cook County	2.20	2.72	+24	11	9
64	Northwest Cook County	2.18	3.05	+40	12	7
67	Elk Grove-Wheeling	2.24	2.95	+32	10	8
	Remote Suburban Subtotal	9.22	12.07	+31	−	−
TOTAL		41.54	43.21	+4	−	−

Source of underlying data: State Farm Mutual Automobile Insurance Company

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TABLE 29

EARNED CAR YEARS BY TERRITORY AS A PERCENTAGE OF STATEWIDE VALUES FOR
AUTOMOBILE COMPREHENSIVE INSURANCE DURING 1970 AND 1975

Territory Number	Territory Name	Percentages 1970	1975	Percentage Change	Ranks 1970	1975
	Urban Territories					
51	Northwest Chicago	3.83	3.87	+1.0	5	5
52	Northeast Chicago	4.43	3.89	-12.2	4	4
53	Central Chicago	3.00	2.40	-20.0	7	11
54	South Chicago	5.15	4.39	14.8	2	3
	Urban Subtotal	16.42	14.56	-11.3	-	-
	Near Suburban Territories					
61	Evanston-Skokie	2.61	2.73	+4.6	9	9
65	Berwyn-Cicero	3.05	2.12	-30.5	6	12
66	West Suburban Chicago	4.99	5.81	+16.4	3	1
68+69+70	South Suburban Chicago	5.90	5.59	-5.3	1	2
	Near Suburban Subtotal	16.55	16.26	-1.8	-	-
	Remote Suburban Territories					
62+71	North Suburban Chicago	2.76	3.50	+26.8	8	6
63	South Cook County	2.24	2.71	+21.0	12	10
64	Northwest Cook County	2.27	3.16	+39.2	11	7
67	Elk Grove-Wheeling	2.39	3.08	+28.9	10	8
	Remote Suburban Subtotal	9.65	12.45	+29.0	-	-
TOTAL		42.62	43.27	+1.5	-	-

Source of underlying data: State Farm Mutual Automobile Insurance Company

TABLE 30

EARNED CAR YEARS BY TERRITORY AS A PERCENTAGE OF STATEWIDE VALUES
FOR AUTOMOBILE COLLISION INSURANCE DURING 1970 AND 1975

Territory Number	Territory Name	Percentages 1970	1975	Percentage Change	Ranks 1970	1975
	Urban Territories					
51	Northwest Chicago	3.7	3.8	+3	5	5
52	Northeast Chicago	4.5	4.0	−11	4	4
53	Central Chicago	3.1	2.5	−19	6	11
54	South Chicago	5.1	4.5	−12	2	3
	Urban Subtotal	16.4	14.8	−10	−	−
	Near Suburban Territories					
61	Evanston-Skokie	2.6	2.7	+4	9	10
68,69,& 70	South Suburban Chicago	5.9	5.7	−3	1	2
65	Berwyn-Cicero	3.0	2.1	−30	7	12
66	West Suburban Chicago	5.0	5.9	+18	3	1
	Near Suburban Subtotal	16.4	16.4	0	−	−
	Remote Suburban Territories					
63	South Cook County	2.3	2.8	+22	11	9
64	Northwest Cook County	2.2	3.1	+41	12	7
67	Elk Grove-Wheeling	2.4	3.1	+29	10	8
62 & 71	North Suburban Chicago	2.7	3.5	+30	8	6
	Remote Suburban Subtotal	9.6	12.5	+30	−	−
TOTAL		42.4	43.7	+3	−	−

Source of underlying data: State Farm Mutual Automobile Insurance Company

Chicago has diminished by 9 per cent for automobile liability, by 8 per cent for medical payments, by 11 per cent for comprehensive, and by 10 per cent for collision. However, the share of the remote suburbs has increased by about 30 per cent for all coverages. The percentage figures for the near suburban territories have barely changed over the 5 year period for the four coverages.

The pattern of increases in the remote suburban territories and relative decreases in the urban territories is consistent for all coverages, as can be seen in Tables 27 through 30. Between 1970 and 1975, State Farm increased Cook County's share of the insurance it sold in Illinois by about 3 per cent. It is clear, however, that most of this increase is due to major growth of sales in the suburbs.

There are some possible explanations for the relative sales pattern observed above. First, Chicago seems to be experiencing a net migration of people out of the inner city into the suburbs.[11] Many people in the inner city area of Chicago are apparently moving out to the suburbs. This means that the inner city population is decreasing in number and possibly economic status because those remaining are less likely to be able to afford the move, while the suburbs are apparently gaining in population and wealth.

Moreover, automobile registrations seem to suggest that the potential automobile insurance market in Chicago has declined somewhat between 1970 and 1975. These registration figures are presented below for the four

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[11] The population of Chicago dropped from 3,550,000 in 1960 to 3,094,000 in 1976, a 13% decrease. Chicago also lost about 200,000 manufacturing jobs during this period. See, "Chicago Soon Will Get a New Mayor, and He Will Get Big Problems," Wall Street Journal, April 18, 1977, pp. 1 and 24.

territories in Chicago and for the entire city. [12]

Registered Cars

Territory	1970	1975	Gain or Loss
51-Northwest	161,819	163,741	+ 1,922
52-Northeast	213,595	195,923	- 17,672
53-Central	262,675	251,889	- 10,786
54-South	263,571	282,095	+ 18,524
Total Chicago	901,660	893,648	- 8,012

Although registrations have decreased in Chicago, this is not true for all territories in the city because they increased in two territories. Nevertheless, the potential automobile insurance market in the City of Chicago appears to have diminished both in size and importance, while the opposite seems to be the case for the surrounding suburban territories. These market changes help to explain why State Farm has shown greater growth in the suburbs than in the City of Chicago

Finally, State Farm has had some adverse loss experience in the city territories, expecially for comprehensive and collision. Accordingly, the company may be somewhat reluctant to take on new exposures in this area because of the adverse loss experience for some coverages. Obviously, such reluctance would not be irrational from an economic viewpoint.

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[12] These figures were obtained from the 1970 census figures on car registrations by territory and the R.L. Polk Company provided the vehicle registrations for 1975, according to State Farm. Memorandum enclosed with Hiestand letter to Bixby, op. cit.

EQUITY AND POLICYHOLDER DIVIDENDS

Policyholder Dividends

State Farm, which is a mutual company, has paid "dividends" to its policyholders in Illinois, since 1971.[13] These "dividends" do not represent a return on a capital investment in the company. Rather, they basically reflect cost savings or a refund of excess premiums paid by policyholders during a policy period. Thus, they are usually referred to as policyholder dividends.

Since a mutual insurance company is owned by its policyholders, it supposedly attempts to provide insurance coverage at cost to them. However, a mutual company sometimes inadvertently overcharges its policyholders for the projected benefits promised and then refunds some or all of the excess to them at the end of the policy period after loss costs and expenses have been determined.

Of course, mutual companies are not permitted to guarantee dividend payments because any excess paid by policyholders can be used to strengthen loss reserves and surplus if these funds are needed to protect the solvency of the company.[14] It should also be noted that policyholder dividends tend to vary with company loss experience and mutual companies sometimes try to maintain their competitive status with stock companies by means of dividend payments.

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[13] "Hiestand Statement on Behalf of State Farm," op. cit., p. 9.

[14] As indicated in the previous section, State Farm reduced its premium-to-surplus ratio from about 4 to 1 in 1969 to approximately 2 to 1 in 1975. Clearly, its policyholders had to make a major contribution to surplus during this time period in order to bring about such a dramatic reduction in this ratio.

Although some mutuals may incorporate a specific charge for dividends in their rates, State Farm asserts that it does not deliberately overcharge its policyholders with the intent of refunding any excess later in the form of dividends. The use of policyholder dividends have supposedly been limited to cases where there were unusual economic circumstances. In this respect, State Farm argues that dividends are merely an expedient or temporary device to adjust rates on a retrospective basis and that it relies on its regular rate changes to maintain an adequate income and to allocate costs properly among its policyholders.

In essence, State Farm argues that dividends are paid because of short-comings in forecasts underlying its ratemaking process. That is, the company is unable to predict accurately the impact of inflation and changes in claim frequency on expected loss costs when it develops its rates in a state.[15] Since State Farm's underwriting experience tends to go through profit and loss cycles, it is clear that cost predictions have not always been on target.

According to State Farm, the past ten years have been particularly un-predictable for the company with very pronounced underwriting cycles due to high inflation rates, wage and price controls, problems in obtaining appro-priate rate changes in several states, the oil embargo, and various social changes. All of these factors have had an impact on their experience and on their ability to properly estimate rates. As a consequence, the period 1971 through 1973 was an unusually profitable one for State Farm nationally, as well as in Illinois. Thus, the company was forced to use dividends to supplement its normal ratemaking process.[16] In other words, policyholder

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[15] Memorandum enclosed with Hiestand letter to Bixby, op. cit.

[16] Ibid.

dividends were supposedly used for making transitory adjustments in State
Farm's overall rate level during profitable years. However, as will be
noted, State Farm also paid dividends in Illinois during 1974 and 1975
after their underwriting results had deteriorated somewhat.

Dividend-Adjusted Loss Ratios and Competition

Policyholder dividends tend to raise loss ratios after these ratios
have been adjusted for dividends. The loss ratio before dividends is de-
fined as the ratio of incurred losses (usually defined to include loss ad-
justment expenses) to earned premiums. On an after-dividend basis, policy-
holder dividends are subtracted from earned premiums before the loss ratio
is computed. Thus, the loss ratio after policyholder dividends is greater
than the loss ratio before dividends because it has a smaller denominator.

If the dividend-adjusted loss ratio of a dividend paying insurance
company is higher than the loss ratios of other companies with comparable
competitive rates who do not pay policyholder dividends, then its policy-
holders probably benefit somewhat from the payment of dividends. Of course,
if the dividend-adjusted loss ratio is about equal to the loss ratios for
other competitive companies then dividends yield no special benefit to the
policyholders. In this case, they merely reflect the return of an overcharge
of a "risk premium" which has the effect of shifting part of the insurer's
underwriting risk to its policyholders. Thus, it might be argued that the
insurer's policyholders in the latter case are in a less desirable position
than if they insured with other competitively priced companies who did not
pay dividends because they have to bear some of the insurer's underwriting
risk.

A more detailed discussion of loss and profit ratios is presented below. Then, an analysis of policyholder dividends paid by State Farm is developed.

Loss Ratios and Underwriting Profit Ratios

State rate regulatory laws usually indicate rates should not be inadequate, excessive, or unfairly discriminatory. In general, these laws have been interpreted as meaning that an insurance company should treat all classes equitably and should not earn exorbitant underwriting profits from any one class of customers.

In an attempt to meet these standards, insurers basically decided that (ignoring such things as risk) the rate of underwriting profit should be equal for all major classes of customers. Such a proposition can probably be justified from an equity viewpoint by arguing that if the insurer did not earn equal rates of profit for all classes then classes from which it earned higher rates of profit would be subsidizing the classes from which it earned lower rates of profit. Such a rate structure might be deemed to be inequitable.

From an economic viewpoint, if underwriting profit rates were not equal for all major classes, insurers would be motivated to sell more insurance in classes with higher profit margins and less in classes with lower profit rates. For example, if low profit classes and territories were largely in Chicago and high profit classes and territories were in Southern Illinois, one would expect to find insurers reducing their business in Chicago because the area was unprofitable and opening new agencies in more profitable areas of Southern Illinois. Those insurers who concentrated their underwriting in Southern Illinois would tend to be more profitable than those who concentrated their sales in Chicago, other things being

equal. The net result of this situation would be that some drivers in Chicago would have difficulty buying automobile insurance. Thus, an availability problem might tend to develop if profit ratios were not equalized among classes and territories.

In order to understand the following analysis, one should be familiar with the various components of an insurance rate. An insurance rate is composed of three elements: (1) loss and loss adjustment costs, L, (2) expenses, E, and (3) a margin for underwriting profit, P. Accordingly, an insurance rate can be specified as being equal to the sum of these three components:

$$R = L + E + P.$$

If this relationship is divided by the insurance rate, the following fractional (percentage) breakdown of the rate is obtained:

$$L = \frac{L}{R} + \frac{E}{R} + \frac{P}{R}$$

where: $\frac{L}{R}$ = the loss ratio,

$\frac{E}{R}$ = the expense ratio, and

$\frac{P}{R}$ = the underwriting profit ratio.

Since the expense ratio is fairly constant in practice, the ratio relationship can be rearranged as follows:

$$1 - \frac{E}{R} = \frac{L}{R} + \frac{P}{R}.$$

If the expense ratio is approximately constant, then the difference, one minus the expense ratio, (1 - E/R) can be treated as a constant K and the relationship can now be specified as follows:

$$K = \frac{L}{R} + \frac{P}{R}$$

By subtracting the underwriting profit ratio from both sides of the equation, the following relationship between the loss ratio and profit ratio is obtained.

$$\frac{L}{R} = K - \frac{P}{R}$$

Thus, it can be seen that the actual loss ratio varies inversely with the underwriting profit ratio in practice. That is, if the actual loss ratio is high, the profit ratio has to be low and vice versa.

The inverse relationship between loss ratios and underwriting profit ratios can be illustrated by assigning some values to the expense ratio and loss ratio. If we assume the expense ratio is 30 per cent of the rate then K will equal 70 per cent. Thus, the relationship is as follows.

$$\frac{L}{R} = 0.70 - \frac{P}{R}$$

By assigning some values to the loss ratio (L/R) now, the following illustrative results can be obtained.

Loss Ratio (L/R)	Profit Ratio (P/R)
0.55	0.15
0.60	0.10
0.65	0.05
0.70	0.00
0.75	-0.05

The inverse relationship between loss and profit ratios should now be apparent. As the loss ratio increases from 55 to 75 per cent, the profit ratio decreases from 15 per cent to a negative 5 per cent (a 5 per cent underwriting loss). Obviously, if policyholder dividends were considered here, the loss ratios would increase and the corresponding profit ratios would decrease after the ratios were adjusted for dividends.

In practice, when insurers try to equalize loss ratios among territories in Illinois for ratemaking purposes, this means they are basically trying to equalize underwriting profit rates among territories. However, because loss costs are random in nature, actual loss ratios and underwriting profit ratios are not always equal among all territories even though insurers attempt to equalize these ratios on an ex ante basis when they set rates. Thus, the actual profit ratios are usually not equal for all territories on an ex post basis. Of course, policyholder dividends could be used to promote such an objective on an ex post basis. However, State Farm does not follow such a policy, as will be shown shortly.

The fact that underwriting profit ratios are usually not equal on an ex post basis is demonstrated by the underwriting profit ratios of State Farm in Illinois. These ratios by territory are presented in Tables 31 through 34 for the four basic automobile coverages: bodily injury and property damage liability, medical payments, comprehensive, and collision respectively. These same ratios after being adjusted for policyholder dividends are reported in Tables 35 through 38 for each coverage. It can be seen that policyholder dividends decrease the underwriting profit ratios of State Farm in each territory shown and for the State of Illinois as a whole.[17] In fact, some underwriting profit ratios change from a positive to a negative figure after being adjusted for policyholder dividends. That is, an underwriting profit in a territory sometimes becomes an underwriting

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[17] The underwriting profit ratios after dividends in Tables 35 through 38 somewhat understate the true after-dividend ratios because dividends were subtracted from the numerator but not the denominator when these ratios were calculated. This means that both underwriting profits and underwriting losses are understated on a relative basis in these tables.

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TABLE 32

UNDERWRITING PROFIT OR LOSS RATIO

MEDICAL PAYMENTS COVERAGE

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	37.8	32.5	23.9	9.6	17.6	22.1
51	49.6	46.1	12.0	16.9	12.9	1.2
52	41.9	40.0	-10.0	- 2.1	20.7	8.4
53	35.8	17.3	3.5	- 0.8	-18.9	3.4
54	41.4	36.6	- 1.2	6.0	-10.0	19.8
61	50.8	40.8	25.3	17.5	8.4	42.5
62	60.7	45.6	21.6	27.9	- 2.1	38.1
63	41.6	39.7	20.4	6.2	- 4.4	24.6
64	43.3	39.8	24.5	8.1	8.1	11.4
65	41.3	28.2	20.1	22.6	0.6	46.6
66	44.0	36.4	12.3	2.2	18.2	27.6
67	57.3	30.9	29.4	4.5	27.8	45.2
68	43.8	35.7	20.7	10.0	18.2	13.3
69						53.1
70						49.7
71						61.2

Source: State Farm Mutual Automobile Insurance Company

TABLE 33

UNDERWRITING PROFIT OR LOSS RATIO

COMPREHENSIVE

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	- 6.2	15.2	16.8	12.8	0.9	- 8.7
51	4.4	24.8	13.1	9.2	- 4.4	-16.1
52	-24.2	12.2	11.9	12.2	5.8	-22.1
53	-38.3	5.1	15.3	- 3.6	- 3.5	-20.6
54	- 7.2	7.3	12.9	3.0	- 5.3	-26.4
61	4.1	22.5	13.5	6.9	11.9	- 1.8
62	- 6.8	9.8	16.6	11.8	24.3	-25.2
63	-19.5	18.6	7.2	- 4.7	1.1	-24.8
64	- 0.1	23.6	12.4	24.7	10.1	.2
65	-16.1	19.0	8.2	- 0.7	- 9.1	-37.5
66	- 0.8	23.5	17.5	19.8	- 3.7	-45.5
67	- 1.7	19.9	17.2	8.4	15.3	7.4
68	- 21.4	5.4	14.0	9.7	- 1.1	-38.1
69						64.5
70						67.1
71						65.4

Source: State Farm Mutual Automobile Insurance Company

TABLE 34

UNDERWRITING PROFIT OR LOSS RATIO

COLLISION

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	- 4.9	16.6	14.6	5.5	- 2.1	- 7.8
51	- 5.7	20.2	17.6	2.6	-11.8	-16.1
52	-13.2	13.7	12.4	- 1.5	-17.2	-20.8
53	-34.6	2.6	- 2.4	-13.2	-20.3	-25.1
54	-17.1	13.7	12.0	- 3.2	-14.0	-18.7
61	- 8.3	15.2	16.5	7.5	- 6.5	- 1.1
62	- 7.0	15.6	15.8	8.4	- 4.5	-35.3
63	- 3.9	21.8	13.8	7.1	- 4.4	- 5.4
64	0.3	17.8	19.9	3.4	2.5	-13.5
65	-15.0	15.5	7.5	- 3.0	- 4.8	-24.9
66	- 9.6	18.5	10.0	1.3	- 4.8	- 3.8
67	- 1.0	19.3	19.2	9.4	- 0.9	4.6
68	- 5.0	16.4	18.0	7.1	- 3.8	-30.8
69						58.5
70						61.4
71						64.7

Source: State Farm Mutual Automobile Insurance Company

TABLE 35

UNDERWRITING PROFIT OR LOSS RATIO
(After Policyholder Dividends)

BODILY INJURY/PROPERTY DAMAGE LIABILITY

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	1.6%	22.7%	14.3%	3.3%	- 6.2%	5.9%
51	7.0	32.6	26.7	13.7	- 2.9	17.1
52	- 2.8	27.6	25.5	9.3	6.4	2.1
53	-11.9	20.0	30.9	- 7.9	-19.5	- 5.7
54	5.2	17.8	30.2	20.8	0.6	6.5
61	13.3	15.7	12.8	-19.9	-16.2	3.4
62	14.5	27.4	11.6	- 9.2	-24.0	-32.2
63	7.8	16.1	11.1	-22.2	-19.9	22.1
64	-16.5	28.9	0.7	-14.3	- 8.5	2.8
65	- 4.1	29.0	24.8	- 9.0	-25.0	-13.8
66	- 2.3	27.1	16.3	14.3	-29.5	9.6
67	16.8	33.2	- 2.8	- 6.9	15.6	- 0.5
68	- 2.3	20.7	10.0	6.8	- 7.9	-21.0
69						62.1
70						62.8
71						66.9

Source: State Farm Mutual Automobile Insurance Company

TABLE 36

UNDERWRITING PROFIT OR LOSS RATIO
(After Policyholder Dividends)

MEDICAL PAYMENTS COVERAGE

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	37.8%	30.4%	16.1%	- 1.5%	12.0%	21.3%
51	49.6	44.0	4.2	5.8	7.3	.4
52	41.9	37.9	-17.8	-13.2	15.1	7.6
53	35.8	15.2	- 4.3	-11.9	-24.5	2.6
54	41.4	34.5	- 9.0	- 5.1	-15.6	19.0
61	50.8	38.7	17.5	6.4	2.8	41.7
62	60.7	43.5	13.8	16.8	- 7.7	37.3
63	41.6	37.6	12.6	- 4.9	-10.0	23.8
64	43.3	37.7	16.7	- 3.0	2.5	10.6
65	41.3	26.1	12.3	11.5	- 5.0	45.8
66	44.0	34.3	4.5	- 8.9	12.6	26.8
67	57.3	28.7	21.6	- 6.6	22.2	44.4
68	43.8	33.6	12.9	- 1.1	12.6	12.5
69						52.3
70						48.9
71						60.4

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TABLE 37

UNDERWRITING PROFIT OR LOSS RATIO
(After Policyholder Dividends)

COMPREHENSIVE

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	- 6.2%	13.1%	9.0%	1.7%	- 4.7%	- 9.5
51	4.4	22.7	5.3	- 1.9	-10.0	-16.9
52	-24.2	10.1	4.1	1.1	0.2	-22.9
53	-38.3	3.0	7.5	-14.7	- 9.1	-21.4
54	- 7.2	5.2	5.1	- 8.1	-10.9	-27.2
61	4.1	20.4	5.7	- 4.2	6.3	- 2.6
62	- 6.8	7.7	8.8	0.7	18.7	-26.0
63	-19.5	16.5	- 0.6	-15.8	- 4.5	-25.6
64	- 0.1	21.5	4.6	13.6	4.5	- .6
65	-16.1	16.9	0.4	-11.8	-14.7	-38.3
66	- 0.8	21.4	9.7	8.7	- 9.3	-46.3
67	- 1.7	17.8	9.4	- 2.7	9.7	6.6
68	-21.4	3.3	6.2	- 1.4	- 6.7	-38.9
69						63.7
70						66.3
71						64.6

Source: State Farm Mutual Automobile Insurance Company

TABLE 38

UNDERWRITING PROFIT OR LOSS RATIO
(After Policyholder Dividends)

COLLISION

(Calendar Year Basis)

State or Territory	1970	1971	1972	1973	1974	1975
Illinois	- 4.9%	14.5%	6.8%	- 5.6%	- 7.7%	- 8.6
51	- 5.7	18.1	9.8	- 8.5	-17.4	-16.9
52	-13.2	11.6	4.6	-12.6	-22.8	-21.6
53	-34.6	0.5	-10.2	-24.3	-25.9	-25.9
54	-17.1	11.6	4.2	-14.3	-19.6	-19.5
61	- 8.3	13.1	8.7	- 3.6	-12.1	- 1.9
62	- 7.0	13.5	8.0	- 2.7	-10.1	-36.1
63	- 3.9	19.7	6.0	- 4.0	-10.0	- 6.2
64	0.3	15.7	12.1	- 7.7	- 3.1	-14.3
65	-15.0	13.4	- 0.3	-14.1	-10.4	-25.7
66	- 9.6	16.4	2.2	- 9.8	-10.4	- 4.6
67	- 1.0	17.2	11.4	- 1.7	- 6.5	3.8
68	- 5.0	14.3	10.2	- 4.0	- 9.4	-31.6
69						57.7
70						60.6
71						63.9

loss after dividends are paid to policyholders in the territory. These
facts can be observed by comparing some of the figures in Tables 31 and
35 for the liability coverages.

Policyholder Dividends and Underwriting Profit Ratios

As suggested earlier, the policyholder dividend mechanism could serve
as an ex post device to equalize underwriting profit ratios among territories
because it would be possible to allocate excess premium funds to territories
which generated low loss ratios and above average underwriting profits.
Policyholders in territories in which underwriting losses were sustained
would not receive any policyholder dividends because, on an ex post basis,
it could be argued that they paid no excess premiums on the average. State
Farm, however, does not follow such a policy. It pays dividends as a uniform
percentage of the premiums paid in each territory in Illinois. Thus, State
Farm does not attempt to equalize loss ratios or underwriting profit ratios
on an ex post basis.

The uniform dividend ratio or percentage paid by State Farm during each
year for 1970 through 1975 in the State of Illinois is presented in Tables
39 through 42 for the four basic automobile insurance coverages. As can be
observed by comparing figures in these tables, the same dividend rate was
applied to each coverage and territory during a given year. In other words,
the dividend rate was not varied by coverage or territory even though under-
writing profit ratios varied substantially by coverage and territory.

The use of a uniform dividend rate by State Farm seems to be a some-
what inequitable economic policy because no attempt is made to equalize
underwriting profit ratios on an ex post basis. In this respect, policy-
holders in unprofitable territories in Illinois appear to be partially

TABLE 39

DIVIDEND RATES, UNDERWRITING RATIOS, AND EARNED EXPOSURES OF STATE FARM
FOR AUTOMOBILE B.I. AND P.D. LIABILITY INSURANCE DURING 1970-1975

	1970	1971	1972	1973	1974	1975
Dividend Rate	0%	2.1%	7.8%	11.1%	5.6%	0.8%
Underwriting Profit Before Dividends	1.6%	24.8%	22.1%	14.4%	-0.6%	6.7%
Loss and Allocated Loss Adjustment Expense Ratio	67.5%	48.2%	52.8%	58.7%	70.8%	67.1%
Underwriting and Unallocated Loss Adj. Expense Ratio	31.0%	27.0%	25.1%	26.9%	29.8%	26.2%
Illinois Total Earned Cars	735,215	735,755	764,557	814,704	873,589	908,605
Change in Earned Cars Between Years		540	28,802	50,247	59,125	35,016

Source of underlying data: State Farm Mutual Automobile Insurance Company

TABLE 40

DIVIDEND RATES, UNDERWRITING RATIOS, AND EARNED EXPOSURES FOR
AUTOMOBILE MEDICAL PAYMENTS COVERAGE DURING 1970-1975

	1970	1971	1972	1973	1974	1975
Dividend Rate	0%	2.1%	7.8%	11.1%	5.6%	0.8%
Underwriting Profit Before Dividends	37.8%	32.5%	23.9%	9.6%	17.6%	22.1%
Loss and Allocated Loss Adjustment Expense Ratio	36.3%	41.0%	37.8%	63.1%	55.3%	53.6%
Underwriting and Unallocated Loss Adj. Expense Ratio	25.9%	26.5%	38.3%	27.3%	27.1%	24.3%
Illinois Total Earned Cars	693,959	703,017	746,412*	796,341	850,512	882,517
Change in Earned Cars Between Years		9058	43,395	49,929	54,171	32,005

*Only half a calendar year of data were supplied so this figure is double the half year value.

Source of underlying data: State Farm Mutual Automobile Insurance Company

TABLE 41

DIVIDEND RATES, UNDERWRITING RATIOS, AND EARNED EXPOSURES
FOR AUTOMOBILE COMPREHENSIVE COVERAGE DURING 1970-1975

	1970	1971	1972	1973	1974	1975
Dividend Rate	0%	2.1%	7.8%	11.1%	5.6%	0.8%
Underwriting Profit Before Dividends	-6.2%	15.2%	16.8%	12.8%	0.9%	-8.7%
Loss and Allocated Loss Adjustment Expense Ratio	78.9%	57.2%	57.2%	61.5%	72.4%	83.0%
Underwriting and Unallocated Loss Adj. Expense Ratio	27.3%	27.6%	26.0%	25.7%	26.7%	25.7%
Illinois Total Earned Cars	668,591	660,072	681,107	730,562	789,397	825,190
Change in Earned Cars Between Years	-8519	21,035	49,455	58,835	35,793	

Source of underlying data: State Farm Mutual Automobile Insurance Company

TABLE 42

DIVIDEND RATES, UNDERWRITING RATIOS, AND EARNED EXPOSURES FOR
AUTOMOBILE COLLISION COVERAGE DURING 1970-1975

	1970	1971	1972	1973	1974	1975
Dividend Rate	0%	2.1%	7.8%	11.1%	5.6%	0.8%
Underwriting Profit Before Dividends	-4.9%	16.6%	14.6%	5.5%	-2.1%	-7.8%
Loss and Allocated Loss Adjustment Expense Ratio	77.5%	55.3%	59.5%	68.9%	75.2%	82.2%
Underwriting and Unallocated Loss Adj. Expense Ratio	27.4%	28.1%	25.9%	25.6%	26.9%	25.6%
Illinois Total Earned Cars	592,800	582,400	603,824	651,676	704,676	732,997
Change in Earned Cars Between Years		-10,400	21,424	47,852	53,000	28,321

Source of underlying data: State Farm Mutual Automobile Insurance Company

subsidized by policyholders in other profitable territories, other things being equal. Thus, State Farm's current dividend policy does not appear to be completely equitable in an economic sense.

To illustrate the effect of State Farm's dividend policy consider two territories, A and B, which have equal average premiums of $100 for equivalent coverages. If territory A has a loss ratio of 75 per cent and territory B develops a loss ratio of 50 per cent, a uniform dividend rate of 10 per cent would award $10 to both territories without recognizing differences in loss ratios. If both territories had an expense ratio of 25 per cent, territory A would have generated no profit for the company, whereas territory B would have generated $25 profit for the company before dividends. After dividends, territory A would have produced a $10 underwriting loss and territory B would have produced a $15 underwriting profit for the company. Therefore it can clearly be seen that policyholders in B would be partly subsidizing those in A, other things being equal. There may be a social rationale for such a uniform dividend policy, but a strong economic justification for such a practice is not apparent.

Of course, there may be some special cost and competitive considerations which might support an economic argument for a uniform dividend rate policy. For example, State Farm has indicated that their uniform dividend policy has helped to reduce its lapse rate and to generate goodwill.[18] There would also be some extra expenses involved in determining how to allocate dividends on a non-uniform basis among different automobile coverages and territories.

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[18] "Hiestand Statement on Behalf of State Farm," op. cit., p. 9, and the associated "Responses to a Commission Questionnaire," p. 7.

Obviously, this process would involve some estimates because reserves for outstanding claims would have to be considered in the allocation process. This is not a new problem, however, because the same type of estimation problem is associated with the normal ratemaking process.[19]

The underwriting profit ratio before dividends in Illinois during a given year appears to exert a strong effect on the dividend rate paid by State Farm for one or two years thereafter. It can be seen in Tables 39 through 42 that the dividend rate peaked about two years after the peak in the underwriting profit ratio and that dividends were paid in 1974 when State Farm sustained an underwriting loss in two of the automobile lines (automobile liability and collision).

Rate increases also influence underwriting profits and dividends. In Table 43, it can be observed that relatively large rate increases in 1970 and 1971 preceded the large underwriting profits in 1971 and 1972. Apparently, because of the good underwriting experience in 1971 and 1972, average automobile insurance rates in Illinois were reduced by 4.0 per cent toward the end of 1972. Average rates in Illinois were again reduced by 0.1 per cent in the middle of 1974 after State Farm had earned another good underwriting profit in 1973. Thus, major rate increases tended to precede years with high underwriting profits. Policyholder dividends were then used to return some of these profits to policyholders and rate decreases were instituted to reduce the anticipated magnitude of future underwriting profits.

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[19] If the company did not pay a uniform dividend, it would also be difficult for it to advertise that it paid dividends to its policyholders. It would be necessary to indicate that dividends were only paid to some of its automobile insurance policyholders which would tend to reduce the public relations value of dividend payments.

TABLE 43

RATE CHANGES FOR AUTOMOBILE INSURANCE IN ILLINOIS

BY STATE FARM MUTUAL DURING 1970-1975

Territory	Effective Date and Rate Changes By Territory					
	3/30/70	2/13/71	10/1/72	5/1/74	4/1/75	10/1/75
51	5.1%	6.7%	-0.1%	2.7%	7.2%	10.0%
52	13.0	23.0	-9.9	3.2	8.4	9.5
53	13.0	28.3	-8.0	3.9	10.9	11.4
54	11.0	11.6	0.0	3.3	9.6	9.7
61	6.2	7.8	-8.2	0.6	11.9	11.8
62	8.7	5.9	-4.6	0.0	8.8	-
63	14.3	9.6	-9.5	1.2	8.0	8.8
64	12.0	10.2	-5.0	-0.1	9.2	10.0
65	7.5	10.5	-4.0	1.8	8.9	11.5
66	7.5	10.3	-5.5	0.6	8.6	10.1
67	14.8	5.1	-8.0	0.0	7.3	7.8
68	6.9	13.3	-4.6	0.6	7.7	-
69	-	-	-	-	-	17.7
70	-	-	-	-	-	7.5
71	-	-	-	-	-	5.9
Entire State	13.8%	10.1%	-4.0%	-0.1%	8.0%	8.8%

Source: State Farm Mutual Automobile Insurance Company

Since State Farm substantially reduced its premium-to-surplus ratio between 1970 and 1975, some of the underwriting profits during this period were clearly used to build up its surplus. From an economic viewpoint, the lower premium-to-surplus ratio tends to reduce the probability of insolvency during adverse underwriting periods. However, if surplus gets too large or the premium-to-surplus too low, inequities between generations of policyholders could develop. State Farm's premium-to-surplus ratio of about 2 to 1 at the end of 1975 does not appear to be too conservative because such a ratio has usually been deemed to be reasonable by regulators.

Equity and Policyholder Dividends

As previously indicated, the reason why State Farm uses a uniform dividend rate regardless of coverage or territory is not entirely clear. Perhaps it is not reasonable in a practical sense to expect that every territory and automobile insurance coverage should be assigned a different dividend rate based on the associated profitability. Nevertheless, it should be noted that the various coverages show different underwriting profit patterns by territory and statewide. For example, the comprehensive and collision coverages appear to be less profitable to State Farm than the liability and medical payments coverages in many territories, especially the four territories in Chicago.[20] Since the liability and medical payments coverages were relatively more profitable in many territories, they would seem to deserve a higher dividend rate than the comprehensive or collision coverages in these territories if costs were to be allocated on an equitable basis among coverages and territories.

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[20] This conclusion follows from inspection of the underwriting profit or loss ratios for the various coverages in Tables 35 through 38.

A uniform dividend rate may enable State Farm to be more competitive in certain territories where competitive pressures are intense. However, policyholders in some territories may end up subsidizing the company's expansion and competitive position in other territories in Illinois. If the policyholders are aware of this possiblity and are willing to pay the price, all is well. If not, they probably should be made aware of the subsidy they may be paying.[21]

There may possibly be a broader social purpose to State Farm's uniform dividend policy. It appears as if underwriting losses, expecially for comprehensive and collision coverages, are frequently incurred in the center city territories where insureds possibly are less likely to be able to afford the premiums for auto insurance. A uniform dividend policy in this case could possibly be conceived of as a form of subsidy to less affluent policyholders, as well as a social device to accomodate city residents. As long as the other policyholders are aware of the way dividends are distributed by State Farm, such a uniform dividend rate policy may be an acceptable social device to make insurance available to those least able to afford it. Competitive market pressures, however, would tend to place some limitations on such a use of the private insurance mechanism. Of course, rate adjustments could be used and possibly are used to reduce the magnitude of the inequities created by the use of a uniform dividend policy.

Philosophically, it is not clear to the author that subsidies or social transfer payments should be explicitly made under the private insurance system. Social inequities should probably be dealt with and corrected by

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[21] There is a possibility that State Farm uses rate adjustments to offset some of the inequities that appear to result from its use of a uniform dividend policy.

the government rather than by the private sector of our economy. Of course, rate regulatory pressures in some states may not permit a completely equitable allocation of insurance costs. However, since rates are not regulated in Illinois, regulatory pressures should be less pronounced in this state than in many other states.

Profit Ratios and Marketing Trends

Since policyholder dividends are apparently not used on an ex post basis for equalizing underwriting profit ratios among territories by State Farm, other methods may be employed. One means of equalizing profit ratios is to increase rates and reduce the amount of coverage written in territories where large losses are regularly sustained. State Farm seems to follow such an approach because the rates it charges and the number of exposures it writes in a territory tends to vary with the territorial loss experience.

If a territory is profitable, State Farm appears to increase the coverage it writes in the territory. If profits begin to diminish, the rate of increase in sales tends to slow down, and if the territory sustains a loss, actual reductions tend to occur in the number of exposures written. The data examined seem to indicate a two year lag before the effects of a profitable or unprofitable year are reflected in the number of exposure units written in a territory. Insurance rate changes also appear to lag about one year behind profitability changes. However, rate increases for unprofitable territories appear to be somewhat more pronounced than rate decreases for unprofitable territories. This rating procedure may tend to offset some of the inequities resulting from the uniform dividend rate policy utilized by State Farm in Illinois.[22]

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[22] Of course, such a procedure could create new inequities for terminating and new policyholders. Thus, the use of a uniform dividend policy does not seem to be desirable even if rate adjustments are used to offset some of the inequities created by such a policy.

The practice of reducing sales rates and increasing insurance premiums in unprofitable territories seems to be a reasonable economic means for loss control. However, such a practice may not be very popular with risks who lose their coverage or cannot obtain it in the first place. If the losses are larger in inner city neighborhoods, State Farm could provoke some availability complaints by restricting its sales. Of course, from an economic viewpoint, the company would seem to have an obligation to its policyholders to constrain sales in unprofitable areas or territories in order to keep its rate level down and to minimize subsidies among policyholders.

The relationship between profitability and sales by territory is somewhat obscured by the demographic aspects of the problem. There seems to have been a steady migration of people out of the center city area and into the suburbs around Chicago. So decreases in the relative number of exposures written in some of the center city territories appear to be due to migration, as much as to any marketing restrictions designed to reduce sales in unprofitable areas. Similarly, increases in coverage written in suburban areas, despite adverse loss experience in some cases, cannot necessarily be interpreted as a marketing bias towards the suburbs. It may be partially due to migration and demographic trends in Cook County, other things being equal.

In order to assess the nature and cause of increases or decreases in coverage in various territories, it would be necessary to compare the changes in coverages written with changes in population and other factors. Nevertheless, comparisons between types of coverage over the same time periods which are discussed below tend to show that State Farm does reduce its coverage selectively in areas where its losses are greatest. This is probably a rational economic strategy, although it may create some availability problems at times.

The number of cars insured for bodily injury and property damages liability by State Farm has steadily increased between 1970 and 1975, but at varying rates. The last row in Table 39 shows the difference or absolute rate of change in the number of cars insured from year to year in Illinois. During 1971, for example, State Farm insured only 540 more cars than it had in the previous year, even though major rate increases had been initiated in early 1970 and 1971.[23] However, as profits increased, so did the number of cars insured. The increase between 1971 and 1972 was almost 29,000 cars, and when the profits were relatively high, during the following years, State Farm increased its exposures by over 50,000 cars per year in Illinois. When profits decreased in late 1974, however, the rate of increase in number of cars insured dropped by 40 per cent between 1974 and 1975. Thus, the rate of sales in territories by State Farm appears to be influenced by the profitability of operations,[24] which is not an unexpected or surprising finding from a competitive economic viewpoint.[25]

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[23] See Table 43 for the rate changes instituted between 1970 and 1975.

[24] Obviously, changes in insurance rates influence profitability which in turn affects the sales rate. Based on a lagged regression function, it was found that there was a positive correlation between average statewide rate changes in one year with underwriting profits the following year for each of the four automobile coverages. However, these relationships were not statistically significant at the one per cent level of significance.

Based on antoher lagged regression, it was found that earned exposures during one year varied inversely with rate changes during the preceding year. One would expect to find such a relationship, but it could not be shown to be significant at the one per cent level because of the limited number of observations which were available.

[25] Similar observations could be made about the other automobile insurance coverages examined.

On the basis of the data submitted by State Farm to the Illinois Insurance Laws Study Commission, it is not possible to discern any definite pattern of unfair underwriting or marketing discrimination by class or territory in Cook County. However, a somewhat inequitable dividend policy seems to be used by State Farm in that it does not attempt to equalize its underwriting profit ratios among territories in Illinois on an ex post basis.

The use of a uniform dividend rate appears to be inequitable because insureds in profitable areas tend to subsidize policyholders in the less profitable territories, at least in the short run. However, the inequity resulting from the use of a uniform dividend policy may be offset somewhat by non-uniform prospective rate changes by territory.[26] Nevertheless, the use of a non-uniform dividend policy would seem to be a more appropriate way to promote equity in territorial rate structures.

In order to reduce underwriting losses, State Farm appears to reduce its marketing efforts and increase its insurance rates in territories and lines of automobile insurance as they become less profitable. After profits improve in these territories and lines, State Farm tends to increase its sales efforts and to reduce the magnitude of rate increases. As a means

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[26] Based on a lagged regression function, it was found that underwriting profits in one year were inversely correlated with rate changes during the following year in Illinois. This relationship was statistically significant at the one per cent level of significance. This inverse relationship indicates that rate changes are affected by underwriting profits (or losses) during the preceding year, as one would expect. However, it also may suggest that when dividends are paid in unprofitable territories, larger rate increases may be instituted than would be the case if a uniform dividend policy were not followed. Thus, some inequities of a uniform dividend policy may be partially offset by prospective rate adjustments, but this creates some new inequities for terminating and new policyholders in some territories.

of loss control, this marketing method appears to be economically rational
because lowe⎵ty automobile risks can be avoided. However, it can
create some problems for those drivers who lose their insurance or are
unable to obtain it when times are bad and losses high. State Farm is able
to utilize such a marketing and pricing policy successfully because of its
competitive rate structure and strong market position in most automobile
insurance territories in Illinois.

As suggested above, the uniform dividend rate policy of State Farm
appears to be somewhat inequitable because it tends to subsidize policyholders
in unprofitable territories. It happens that for several types of coverage,
the center city territories in Chicago earn little or no profit, and fre-
quently show underwriting losses. This means the policyholders in some
of these territories may be indirectly subsidized by policyholders in other
territories, at least in the short run. This implies the cost of automobile
insurance for some policyholders might be somewhat less than it would other-
wise be in the center city territories during some time periods. However,
prospective rate adjustments may alleviate some of the inequities created
by State Farm's uniform dividend policy. Of course, such rate adjustments
can create new inequities for new and terminating policyholders.

Since State Farm tries to maintain a fairly homogeneous risk portfolio,
it may be easier for the company to maintain a high flow of applicants which
meet its underwriting standards by using a uniform dividend policy. Never-
theless, it appears that State Farm could vary its dividend rate by territory
and coverage in Illinois with minimal difficulty. If this were done, sub-
sidies between coverages and territories could be reduced. Moreover, such
a dividend policy would help to alleviate the need to State Farm to reduce
its sales growth rate in some territories when underwriting losses are

incurred. A more stable market for automobile insurance consumers in many
territories in Illinois would probably result from a change in State Farm's
dividend policy, other things being equal.

[ILC/SU 11/77-6C]